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Ontario Geological Survey
Open File Report 6139

Report of Activities, 2003 Resident Geologist Program

Kirkland Lake Regional Resident Geologist Report: Sudbury District

2004

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ONTARIO GEOLOGICAL SURVEY

Open File Report 6139

Report of Activities, 2003
Resident Geologist Program

Kirkland Lake Regional Resident Geologist Report:
Sudbury District

by

M. Cosec, J.M. Gaudreau, J.B. Selway and S.A. Beauchamp

2004

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CITY	ADDRESS	OFFICE(S)	TELEPHONE	FAX
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Kirkland Lake Regional Resident Geologist (Sudbury District)–2003

M. Cosec[1], J.M. Gaudreau[2], J.B. Selway[2] and S.A. Beauchamp[2]

[1]District Geologist, Sudbury District, Resident Geologist Program, Ontario Geological Survey

[2]District Support Geologist, Sudbury District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

The Sudbury District Geologist Office includes the judicial districts of Sudbury, Manitoulin, Parry Sound, Muskoka, and parts of Nipissing and the County of Renfrew. It encompasses approximately 45 000 square km and over 340 geographical townships.

Nickel-copper mining operations predominate in the district. The Sudbury area is among the oldest and most economically viable mining camps in the world. Since 1888, approximately CAN$150 billion has been achieved from approximately one billion tons of ore raised.

For the first time in a quarter of a century, the Sudbury camp has a third mining company (aside from Falconbridge Limited and Inco Limited), that being the FNX Mining Company Incorporated/Dynatec Corporation Joint Venture at the McCreedy West Mine in the North Range of the Sudbury Igneous Complex.

Table 1. Summary of claims recorded and assessment work credits filed in the Sudbury Mining Division in 2003.

Year	Claim Units Recorded	Claim Units Cancelled	Claim Units Active	Total ($) assessment work
2003	2801	6519	16 691	$5,249,246.00
2002	4946	8332	24 501	$11,662,525.00
2001	8501	3531	27 444	$4,326,222.00
2000	10 693	3313	22 433	$4,441,042.00
1999	3094	2469	15 215	$2,241,392.00
1998	2445	3815	13 056	$2,182,037.00

MINING ACTIVITY

Nickel and Copper Production

There were 13 nickel-copper mines operated by Falconbridge Limited, FNX Mining Company Incoporated/Dynatec Corporation, and Inco Limited in 2003. Nickel prices rose significantly in late 2003, reaching 14-year highs and finishing the year up 135% from the end of 2002. Copper and cobalt prices were also higher. Refer to Figure 1.

The strong nickel prices were driven by a tight supply, increasing demand from Asia, a shortage of stainless steel, and a lack of new sources of supply (Inco Limited, press release, February 3, 2004).

FUTURES PRICING DATA

NYMEX Metal Futures - 2/12/2004

(Settlement Prices)	Open	High	Low	Last	Change
Jun 2004 Gold	$412.80	$415.40	$411.00	$415.40	5.70
Mar 2004 Silver	$6.54	$6.72	$6.51	$6.62	+0.07
Apr 2004 Platinum	$845.00	$851.00	$843.00	$847.30	+5.30
Mar 2004 Palladium	$243.00	$248.50	$243.00	$248.35	+7.15
Mar 2004 Copper	$1.2300	$1.2500	$1.2270	$1.2420	0.0260

EUROPEAN TRADING

London Metal Exchange - 2/12/2004

(Cash Settlement Prices)	US$/tonne	Change	US$/pound	Change
Copper	$2,708.00	101.00	$1.2283	0.0458
Nickel	$15,635.00	535.00	$7.0919	0.2427

2/13/2004 Modified from NYMEX on www.mineralstox.com/index.asp

2/13/2004 Modified from NYMEX on www.mineralstox.com/index.asp

Figure 1. Metal prices in 2003

FUTURES PRICING DATA

NYMEX Metal Futures - 2/12/2004

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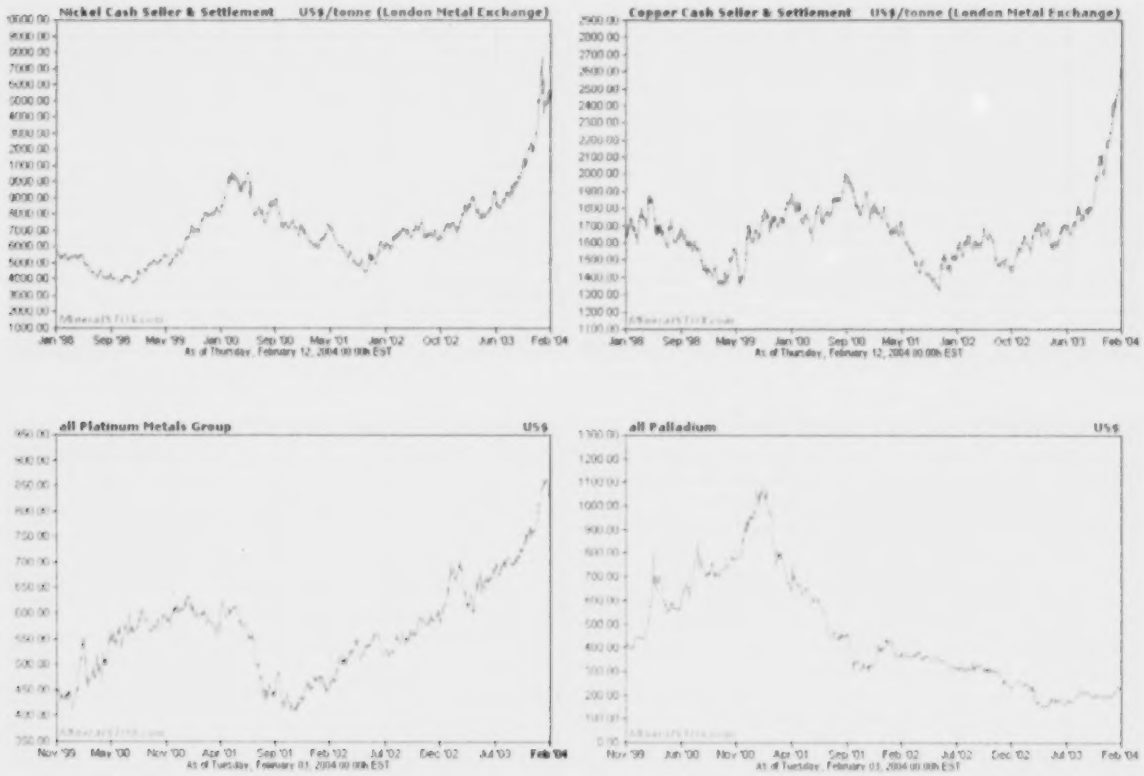
2/13/2004 Modified from NYMEX on www.mineralstox.com/index.asp


Nickel Cash Seller & Settlement US$/tonne (London Metal Exchange)
Copper Cash Seller & Settlement US$/tonne (London Metal Exchange)
all Platinum Metals Group US$
all Palladium US$

2/13/2004 Modified from NYMEX on www.mineralstox.com/index.asp

Figure 1. Metal prices in 2003.

FALCONBRIDGE LIMITED

Falconbridge Limited operated 4 mines in the Sudbury area in 2003. These include the Craig-Onaping and Fraser-Strathcona mines in Levack Township, the Lockerby Mine in Denison Township, and the Thayer Lindsley Mine in Blezard Township. Refer to Figure 2.

All ore is concentrated at the company's Strathcona Mill, which has a capacity of approximately 10 000 tons per day. Copper concentrate is shipped to the Kidd Metallurgical Division for smelting and refining. Nickel-copper concentrate is shipped to the Sudbury smelter for refining. The Sudbury smelter produced matte containing nickel, copper and cobalt, as well as precious metals and platinum group elements, and has the capacity to produce 130 000 tons per year. The matte is shipped to Nikkelverk refinery in Norway for further processing.

Roaster gas is treated in an adjacent plant to produce sulphuric acid, thereby reducing suphur dioxide emissions. The plant has a capacity to produce 300 000 tons of sulphuric acid per year.

Production statistics for 2003 were unavailable at the time of writing.

For 2003, Falconbridge Limited Sudbury operations recorded net income of $194 million, compared to $50 million in 2002 (Falconbridge Limited, press release, February 5, 2004). Falconbridge Limited also celebrated 75 years of operations since its inception in 1928.

FNX MINING COMPANY INCORPORATED / DYNATEC CORPORATION

Production resumed at the former Inco Limited McCreedy West Mine by the FNX Mining Company Incorporated/Dynatec Corporation Joint Venture. This past-producing mine is one of 5 non-core asset properties that have been optioned from Inco Limited. Production started in September of 2003, with a mining rate of 1000 tons per day by early 2004. The ore is taken to surface by ramp, crushed and taken to the Inco Limited Clarabelle Mill for processing. Table 2 shows the resource estimates for a five-year mining plan (FNX Mining Company Incorporated, press release, 2003).

Table 2. McCreedy West – phase 1 mining; measured and indicated resources estimate.

Deposits	Metals	Tons	Cu (%)	Ni (%)	TPM (oz/t)
700	Cu-TPM	139 000	6.10	0.81	0.18
950	Cu-TPM	520 000	1.44	0.27	0.16
Upper Main	Ni	48 000	0.46	1.88	-
Inter Main	Ni	866 000	0.24	2.02	-
East Main	Ni	167 000	0.51	2.36	-
Total Recovered Metal		1.7MM tons	38 MM lbs	50 MM lbs	98 000 oz
Inferred Resource Estimate		**Tons**	**Cu (%)**	**Ni (%)**	**TPM (oz/t)**
Total Inferred Resources		376 000	0.40	1.75	0.18

TPM – Total Precious Metals (Pt + Pd + Au + Ag)

INCO LIMITED

Inco Limited operated 7 underground and one open pit mine in 2003. Processing facilities, which produce a total of 10 commodities, include the Clarabelle Mill (rated capacity approximately 45 000 tons per day), the Copper Cliff Smelter, 4 refineries, 3 sulphuric acid plants, 1 liquid sulphur plant and one oxygen plant.

The Gertrude Mine operated intermittently as a contract open pit operation throughout the year.

Adjusted net earnings for 2003 were US$260 million, compared with adjusted net earnings of US$167 million in 2002 (Inco Limited, press release, February 3, 2004).

Production figures for the Ontario Division were unavailable at the time of writing.

The company experienced a three-month labour disruption by United Steelworkers of America Local 6500 in mid-year.

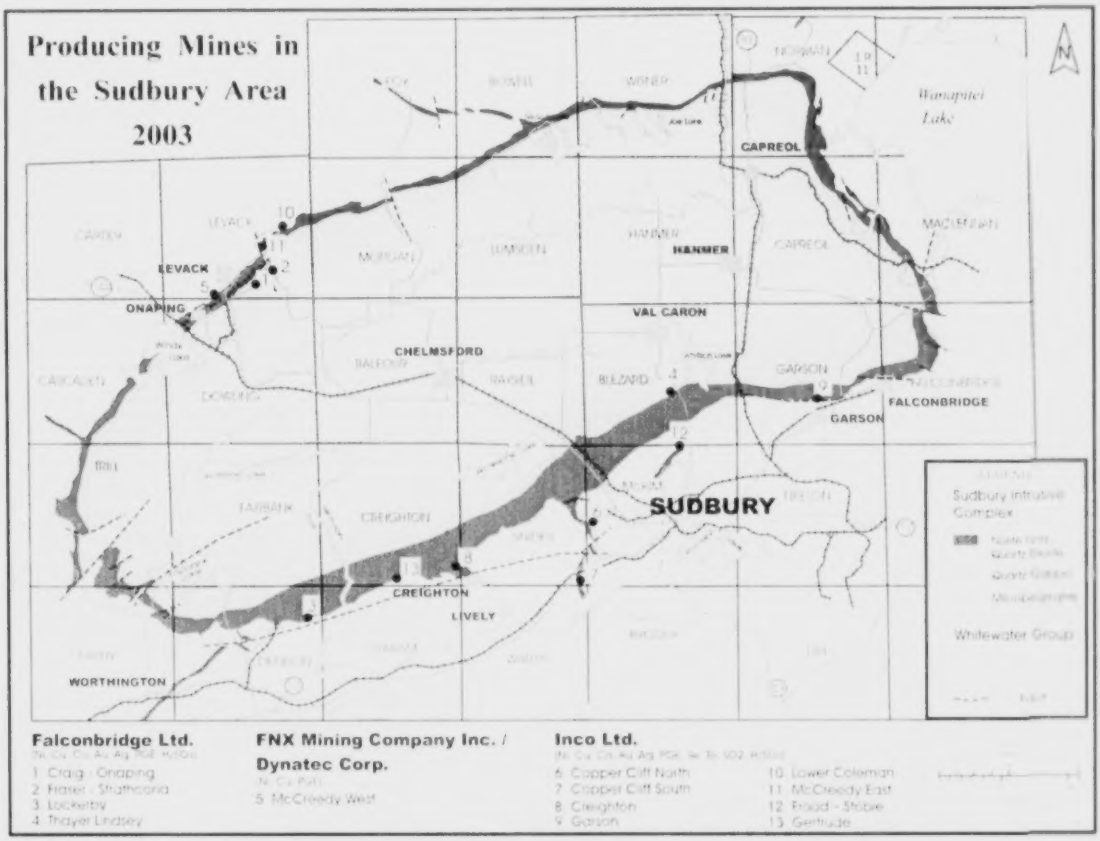


Figure 2. Producing mines in the Sudbury area in 2003.

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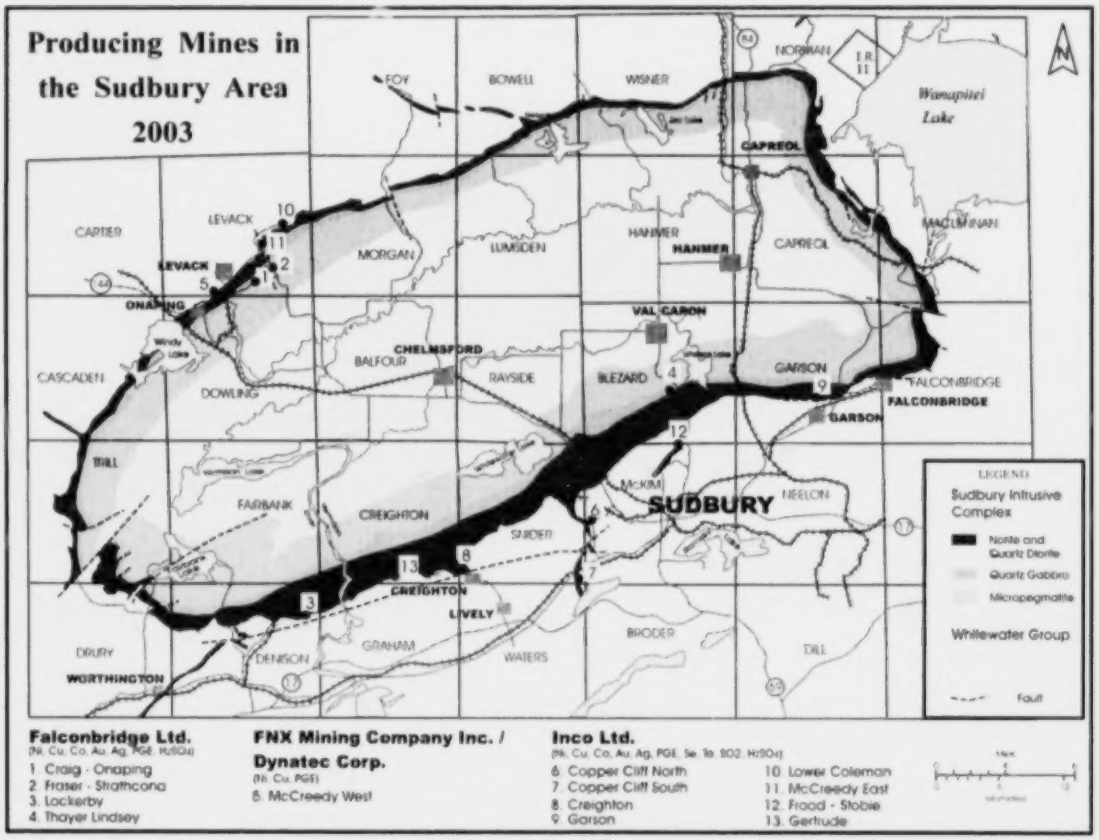

Figure 2. Producing mines in the Sudbury area in 2003.

Industrial Mineral Production

Several industrial mineral commodities were produced in the Sudbury District in 2003 (Table 3, Figure 3). Commodities produced include dolostone, silica, trap rock, flagstone, organic soil conditioner, and sundry varieties of coloured landscape aggregate. Numerous companies extracted a considerable amount of sand and gravel for various purposes.

AGRICULTURAL MINERAL PROSPECTORS INCORPORATED

This company continued its fourth year of seasonal operations producing vermiculite and calcite from the Burns Mine in Venturi and Tofflemire townships, on the Spanish River Carbonatite Complex.

The product is marketed as an agricultural mineral fertilizer and soil conditioner for certified organically produced and conventionally produced crops. The average mineral composition is 70% calcite, 10% apatite, 15% biotite/vermiculite, and 5% accessory minerals. Present markets include Ontario, Michigan, Quebec, Vermont, Pennsylvania, and New York State.

In 2003, approximately 4000 tons were removed from a small pit. To date, the total production is approximately 13 000 tons.

INCO LIMITED

Inco Limited produced high-purity silica from Paleoproterozoic quartz arenite of the Huronian Supergroup at its Lawson Quarry in Whitefish Falls. The material is used as flux at the Inco Limited Copper Cliff smelter. Production statistics are confidential.

LAFARGE CANADA INCORPORATED

Lafarge Canada Incorporated quarried 4.4 million tons of dolostone from its Meldrum Bay quarry in Dawson Township on the western end of Manitoulin Island. Massive dolostones of the Paleozoic Era are excavated in a single lift of approximately 50 feet. The material is classified as 70% construction aggregate and 30% metallurgical grade flux. Lake freighters ship the material to markets in southern Ontario and the United States (M. Wickett, Lafarge Canada Incorporated, personal communication, 2003).

RENGER RESOURCES LIMITED

Renger Resources Limited crushed, sorted and shipped 400 000 tons of low-grade iron ore from the former Moose Mountain Iron Mine in Hutton Township.

The material is from an unprocessed stockpile that remained after the mine ceased operations in 1981. It is shipped by truck to the Canadian National Railway Company siding at Milnet, where it is loaded into maintenance-of-way hopper cars for use as railway ballast. The railway is decreasing its reliance on smelter slag due to perceived environmental concerns (R. Gervais, Renger Resources Limited, personal communication, 2003).

UNIMIN CANADA LIMITED

Unimin Canada Limited produced approximately 500 000 tons of high-grade silica from Bar River Formation quartz arenite of the Paleoproterozoic Huronian Supergroup on Badgeley Island. The material is shipped to Midland, Ontario and Ashtabula, Ohio for further processing (Cosec et al. 2003).

Table 3. Industrial mineral and dimension stone producers in the Sudbury Mining Division in 2003 (keyed to Figure 3).

No.	Township / Area	Company / Individual	Commodity
1	Badgeley Island	Unimin Canada Ltd.	Silica
2	Bigwood	Allstone Quarry Products Inc.	Flagstone (Gneiss), Landscaping Stone
3	Curtin	Inco Ltd.	Silica
4	Dana	Upper Canada Stone Company Ltd.	Decorative Crushed Stone (Anorthosite)
5	Dawson	Lafarge Canada Ltd.	Aggregate (Limestone)
6	Gordon	Canadian Colour Rock Inc.	Flagstone (Limestone), Landscaping Stone
7	Hugel	Rintala Construction Company Limited	Decorative Crushed Stone (Feldspar)
8	Hutton	Renger Resources Limited	Ballast
9	McAuslan	McLaren's Bay Mica Stone Quarries	Flagstone (Gneiss)
10	McDougall	Mill Lake Stone Quarry Ltd.	Flagstone (Gneiss)
11	Ratter	Crea-Mac Contracting Company Ltd.	Decorative Crushed Stone (Granite)
12	Venturi	Agricultural Mineral Prospectors	Organic Fertilizer

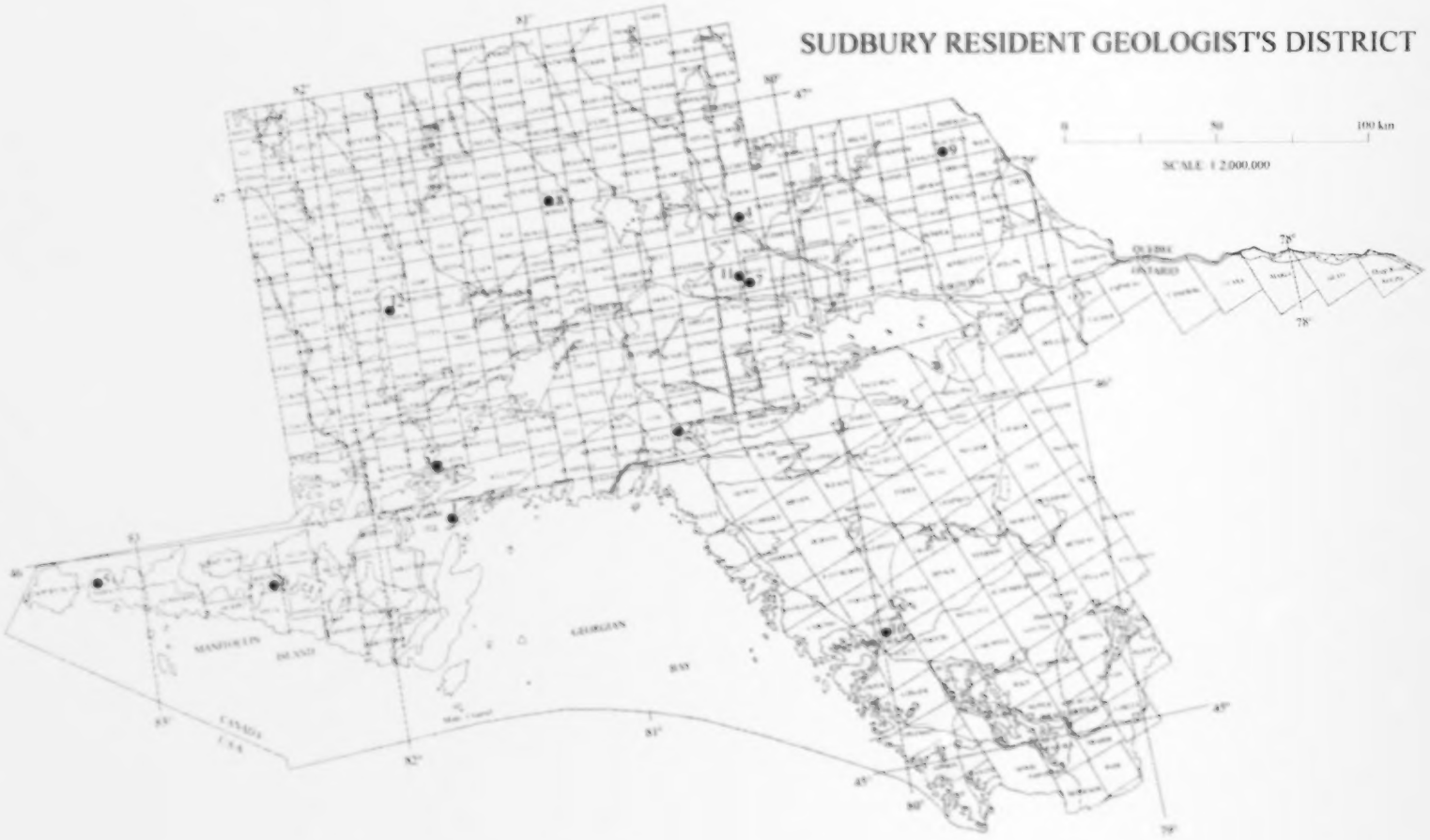

Figure 3. Industrial mineral and dimension stone producers in the Sudbury District in 2003 (keyed to Table 3).

ADVANCED EXPLORATION

Advanced exploration was conducted at most underground mining operations as part of individual mine plans.

Falconbridge Limited

An aggressive exploration program continued at the Nickel Rim South project where drilling has outlined an inferred resource of 6.3 million T grading 1.7% Ni, 3.4% Cu, 2.2 g/t Pt, 2.5 g/t Pd, and 1.5 g/t Au (Giancola 2003). A pilot hole for an exploration shaft also commenced in 2003. More detailed information is presented in Cosec et al. 2003.

EXPLORATION ACTIVITY

The focus of exploration activity in the Sudbury District shifted somewhat in 2003 toward Ni-Cu-PGE exploration on the Sudbury Igneous Complex.

A total of 45 individual exploration programs were conducted in 2003, a slight decease from 2002. Refer to Table 4, Figure 4. Programs of note are highlighted below.

Table 4. Exploration activity in the Sudbury District in 2003 (keyed to Figure 4).

Abbreviations

AEM	Airborne electromagnetic survey	IP	Induced polarization survey
AM	Airborne magnetic survey	Lc	Linecutting
ARA	Airborne radiometric survey	Met	Metallurgical testing
Beep	Beep Mat survey	OD	Overburden drilling
Bulk	Bulk sampling	ODH	Overburden drill hole(s)
DD	Diamond drilling	PEM	Pulse electromagnetic survey
DDH	Diamond drill hole(s)	PGM	Platinum group metals
DGP	Down-hole geophysics	Pr	Prospecting
GC	Geochemical survey	RES	Resistivity survey
GEM	Ground electromagnetic survey	Samp	Sampling (other than bulk)
GL	Geological Survey	Seismic	Seismic survey
GM	Ground magnetic survey	SP	Self-potential survey
GRA	Ground radiometric survey	Str	Stripping
Grav	Gravity survey	Tr	Trenching
HLEM	Horizontal loop electromagnetic survey	UG	Underground exploration/development
HM	Heavy mineral sampling	VLEM	Vertical loop electromagnetic survey
IM	Industrial mineral testing and marketing	VLFEM	Very low frequency electromagnetic survey

No.	Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
1	Angus	Tres-Or Minerals Inc.	2003	Data	2.25143	SP002
1	Angus	Tres-Or Minerals Inc.	2003	GRA, GM, GL, Lc	2.26136	SP003
2	Baldwin	Ursa Major Minerals Inc.	2003	IP, GM, Lc	2.25478	SP018
2	Baldwin	Barry, A.	2003	Tr, Pr	2.26115	SP019
2	Baldwin	Ursa Major Minerals Inc., D&H Cons.	2003	Lc, GEM, GM	2.26615	SP020
2	Baldwin	F.T. Archibald	2003	Samp, GL, Lc, Tr	2.27026	SP021

No.	Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
3	Baxter	Krieger, W.	2003	Pr	2.25469	SP006
4	Beaumont	Brady, J.	2003	Tr, Samp	2.26577	SP003
5	Bowell	Aurora Platinum Corp.	2001 - 2003	Samp, AEM, GM, GL, Pr, Lc	2.25367	SP011
6	Butler	Shouinard, G., Lashbrook, R.	2003	Pr	2.26506	SP021
6	Butler	Shouinard, G., Lashbrook, R.	2003	Pr, Str	2.26504	SP022
6	Butler	Shouinard, G., Lashbrook, R.	2003	Pr	2.26505	SP023
6	Butler	Shouinard, G., Lashbrook, R.	2002 - 2003	Pr	2.26509	SP024
6	Butler	Kyanite Mining	2003	IP	2.26765	SP025
7	Butt	Baxter, D., Vinecrest	2003	GEM, Lc	2.26182	SP045
8	Cascaden	Platinum Group Metals Inc.	2003	GM	2.25452	SP009
8	Cascaden	Wallbridge	2003	DD, Samp	2.25967	SP010
9	Davis	Bradley, J.	2003	Pr, Samp	2.26202	SP069
9	Davis	Sims, W., Wolverine	2003	Pr, Samp	2.26501	SP070
10	Delhi	Explorers Alliance Corp.	2003	Pr, Samp	2.25885	SP002
11	Demorest	Hauser, P.	2003	Pr, Samp	2.25909	SP004
12	Drury	Wallbridge Mining Co. Ltd.	2002 - 2003	IP, Lc, GM, GL	2.26062	SP013
13	Falconbridge	Kinross	2003	Lc, GM, GEM	2.25081	SP034
14	Gooderham	Tres-Or Minerals Inc.	2003	DD	2.25419	SP014
14	Gooderham	Tres-Or Minerals Inc.	2003	DD, Tr	2.26249	SP015
14	Gooderham	Tres-Or Minerals Inc.	2003	GL	2.26248	SP016
14	Gooderham	Tres-Or Minerals Inc.	2003	GC	2.26476	SP017
14	Gooderham	Tres-Or Minerals Inc.	2003	Tr	2.26544	SP018
14	Gooderham	Tres-Or Minerals Inc.	2003	GL	2.26647	SP019
14	Gooderham	Tres-Or Minerals Inc.	2003	Samp, GC	2.26649	SP020
14	Gooderham	Tres-Or Minerals Inc.	2003	GL	2.26549	SP021
15	Graham	Wallbridge Mining Co. Ltd., Falconbridge Ltd.	2001 - 2003	DD	2.26497	SP007
16	Hart	Champion Bear Resources Ltd.	2003	GM, Lc	2.25304	SP016
16	Hart	Champion Bear Resources Ltd.	2003	GM, Lc	2.25301	SP017
16	Hart	Champion Bear Resources Ltd.	2003	GM, Lc	2.26140	SP018
17	Harty	Champion Bear Resources Ltd.	2003	DD, GM	2.25303	SP006
17	Harty	Inco Ltd., Consolidated Venturex	2003	GL	2.25736	SP007
17	Harty	Champion Bear Resources Ltd.	2003	DD, Samp	2.25692	SP008
18	Hess	Champion Bear Resources Ltd.	2002 - 2003	GC, Samp	2.25286	SP034
18	Hess	Sutcliffe, R.	2003	GEM, GM	2.26297	SP035
19	Hutton	Barry, G.	2003	Str	2.26532	SP055
20	Hyman	Mustang Minerals Corp.	2003	GM, Lc	2.25466	SP006
20	Hyman	Mustang Minerals Corp.	2003	IP	2.26201	SP007
21	Janes	Brady, J.	2003	Bulk	2.26030	SO028
22	Kelly	Goldwright	2003	IP	2.25459	SP020
23	Kilpatrick	O'Shaugnessy, J.	2003	GM, GEM	2.25797	SP001
24	Lorne	Wallbridge Mining Co. Ltd.	2003	GM	2.25026	SP008

No.	Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
24	Lorne	Inco Ltd.	2003	GM	2.25739	SP009
25	Mackelcan	Flag Resources	2003	GM, GEM	2.25178	SP025
25	Mackelcan	Flag Resources	2003	DD	2.26189	SP026
25	Mackelcan	Flag Resources	2003	DD	2.26186	SP027
25	Mackelcan	Flag Resources	2003	DD	2.26539	SP028
25	Mackelcan	Flag Resources	2003	DD, Samp	2.27128	SP029
25	Mackelcan	Flag Resources	2003	DD, Samp	2.26708	SP030
26	Maclennan	Wallbridge Mining Co. Ltd.	2002 - 2003	DD, Samp	2.25391	SP024
27	Maria	Industrial Minerals	2002 - 2003	Bulk	2.26315	SP010
28	Marshay	Barry, A.	2003	Tr, Samp	2.26669	SP002
29	McKinnon	Daniels, G.	2003	Pr, Samp	2.26010	SP015
30	McLaren	Morin, R.	2001 - 2003	Pr, Samp	2.25660	SP001
31	Milne	Tres-Or Minerals Inc.	2003	GM	2.26474	SP005
32	Monestime	Ardiel, M.	2001 - 2003	Pr	2.24855	SP002
33	Nairn	Mustang Minerals Corp.	2003	Pr, Samp	2.25636	SP004
34	Neelon	Alaire & Sons Ltd.	2003	GM	2.25918	SP012
34	Neelon	Alaire & Sons Ltd.	2003	VLFEM	2.27047	SP013
35	Norman	Barry, A.	2003	Str	2.26717	SP041
35	Norman	Brady, J., Namex	2002 - 2003	DD, Samp	2.26003	SP042
35	Norman	Brady, J., Namex	2003 - 2004	GC, GM, Pr, Str	2.27039	SP043
36	Parkin	Champion Bear Resources Ltd.	2002 - 2003	DD	2.25334	SP077
36	Parkin	Champion Bear Resources Ltd.	2003	GL	2.26576	SP079
36	Parkin	Champion Bear Resources Ltd.	2003	AEM	2.26827	SP080
36	Parkin	Brady, J., Namex	2003 - 2004	AEM, AM	2.26949	SP081
37	Parkman	Harron, G.	2003	GC, Samp	2.26436	SP012
37	Parkman	Harron, G.	2003	GC, Samp	2.26451	SP013
37	Parkman	Grenville Gold	2003	AM	2.25342	SP014
37	Parkman	Grenville Gold	2003	GM	2.26882	SP015
38	Porter	Ursa Major Minerals Inc.	2003	IP, GM, Lc	2.26053	SP012
39	Rathbun	Flag Resources Ltd.	2003	DD	2.25137	SP055
39	Rathbun	Flag Resources Ltd.	2003	DD	2.26190	SP057
40	Scadding	Brady, J.	2003	Str, Pr, Ptr	2.25976	SP054
41	Shakespeare	Blue, P.	2003	Samp, Pr	2.27198	SP014
42	Tofflemire	Agricultural Mineral Prosp. Inc.	2003	Str	2.26521	SP004
42	Tofflemire	Agricultural Mineral Prosp. Inc.	2003	IM	2.26790	SP005
43	Trill	Wallbridge Mining Co. Ltd.	2002 - 2003	Samp, GL, IP	2.26430	SP006
44	Vogt	Gagnon, G., Gagnon, R.	2002 - 2003	Pr	2.25582	SP003
45	Wisner	Barry, G.	2003	Ptr	2.26338	SP021

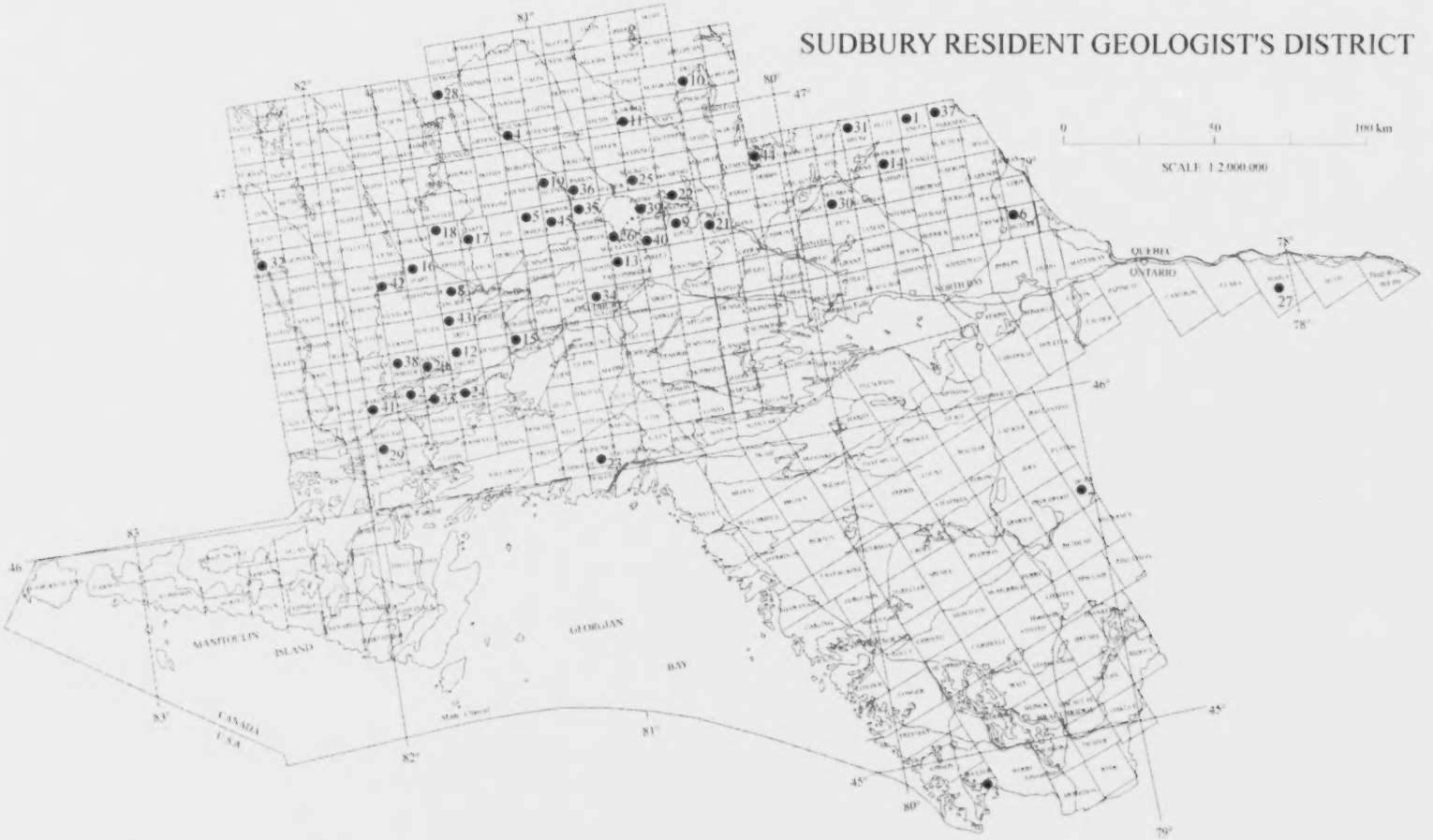

Figure 4. Exploration activity in the Sudbury District in 2003 (keyed to Table 4).

Aurora Platinum Corporation

Aurora Platinum Corp. has several properties in the Sudbury basin, including the Foy, Footwall, North Range and Nickel Lake properties. The Foy and Footwall properties are optioned from or joint ventured with Falconbridge Limited, and the Nickel Lake property is optioned from Inco Limited (www.auroraplatinum.com).

Foy Project

The Foy project is located 30 km northwest of the City of Sudbury along the North Range of the Sudbury Igneous Complex. It covers the Foy Offset Dike for a strike length of 10.5 km.

Footwall Project

The Footwall project is located 15 km northeast of the City of Sudbury in Falconbridge Township, along the South Range of the Sudbury Igneous Complex (SIC). The area covers an 8 km strike length of the SIC between the Garson and Norduna nickel-copper-PGM mines. The Footwall Project covers both Marginal South Range and footwall/structural deposit environments. Falconbridge Limited is the operator of this project and a compilation program of all mine records, geological, geochemical and geophysical data is ongoing.

North Range Project

The North Range project is located 30 km northwest of the City of Sudbury. The North Range Project claims are contiguous with the Foy Project claims covering footwall breccia rocks of the Sudbury Igneous Complex.

Nickel Lake Project

The Nickel Lake project is located 30 km north-northwest of the City of Sudbury along the North Range of the Sudbury Igneous Complex. The property covers the Foy Offset Dike from Nickel Lake in the east to Foster Lake in the west (1.4 km strike length). Several airborne geophysical anomalies extend in an intermittent fashion along the entire length of the Nickel Lake-Foster Lake corridor.

Diamond drilling results from the Nickel Lake property included a zone of massive sulphide intersected in borehole Ni-15, from surface to 17.87 m, grading 1.69% Ni, 0.43% Cu, 0.07% Co, 0.23 g/t Au, 0.64 g/t Pt and 0.88 g/t Pd. This intersection included a higher grade zone from 9.65 m to 15.67 m (6.02 m) that returned a weighted average grade of 4.38% Ni, 0.93% Cu, 0.16% Co, 0.55 g/t Pt and 1.75 g/t Pd. Borehole Ni-15 was drilled vertically to determine the subsurface geometry of an embayment located along the hanging wall of the Foy Offset and to drill-test a coincident airborne (AeroTEM) conductor. The embayment appears to be trough-shaped with the massive sulphides lying along the base. The intersected mineralization appears to coincide with the surface projection of a BHUTEM non-decaying-conductor lying at the northwest end of Nickel Lake (Aurora Platinum, press release, February 12, 2003).

Champion Bear Resources Limited

Champion Bear Resources' primary target is platinum group and precious metals and to a lesser extent polymetallic base metal and pegmatite-hosted tantalum deposits. Champion Bear has 4 properties in the Sudbury District: Halcyon, Parkin North, Parkin South and Iron Mask.

Halcyon Property

Champion Bear Resources Ltd. has completed geological mapping, magnetic surveys and Mobile Metal Ion (MMI) geochemical surveys over the southern half of its Halcyon property. Forty-five kilometres of geological mapping and magnetic surveys were completed. Twenty-four kilometres of MMI sampling was concentrated over 4 previously outlined gold and base metal targets and the extension of the structure hosting the FNX Norman zone (Champion Bear Resources, press release, October 22, 2003).

The southwestern portion of the Halcyon property is underlain primarily by mafic volcanic rocks. Several small isolated (sulphide and oxide facies) iron formations, a small dioritic intrusion and several Nipissing gabbro and/or diabase dikes are present within the volcanics (Champion Bear Resources, press release, October 22, 2003). Anomalous gold has been reported from at least 3 iron formation zones and several carbonated shear zones, all hosted in mafic volcanics (Champion Bear Resources, press release, June 25, 2003).

Dr. M. Fedikow (P.Geo.) identified several MMI anomalies. One northwest-trending multi-element anomaly (Cu, Zn, Cd, Co, Au, Ag, Ni, Pt and Pd) was traced along a strike length of 730 m and several other isolated cluster and single-element anomalies for Au, Ag and Pt were identified (Champion Bear Resources, press release, October 22, 2003). The MMI anomalies flank a large magnetic anomaly, trending both northwest and northeast (Champion Bear Resources, press release, December 17, 2003).

Preliminary results from grab samples collected during the reconnaissance visit to the Halcyon property confirm the presence of gold and base metals on the property. Three of eight grab samples from "zone 3" assayed 3.18 g/t Au, 1.75 g/t Au and 1.12 g/t Au. These samples are from an iron formation hosted within mafic volcanics. Seven grab samples from "zone 1" contained anomalous Cu-Ni-Co values. Cu content ranged from 343 ppm to 2850 ppm (0.29%); Ni values ranged from 100 to 999 ppm; and Co ranged from 58 to 1030 ppm. These values are all from a shear zone cutting previously trenched massive sulphides adjacent to a mafic intrusive. An adjacent area also returned anomalous Cu and Zn values up to 748 ppm and 668 ppm, respectively (Champion Bear Resources, press release, June 25, 2003).

Parkin North Property

Champion Bear has also completed an MMI survey consisting of 140 samples along a 2.2 km strike length of the Parkin Offset dike immediately north of the Wallbridge Milnet property. The most significant response is a multi-sample Ni, Pd-Co anomaly centered approximately 100 m northwest of previous drilling on this property. Prospecting on the Parkin North claims 2.2 km to the north of the Parkin South claims encountered high gold grades from three grab samples of 252.0, 56.7 and 22.3 g/t Au (Champion Bear Resources, press release, September 3, 2003).

Parkin South Property

Champion Bear Resources Ltd. has deepened two previous holes, Nos. BS-16-02 and BS-18-03, drilled on its Parkin South claim block, and has carried out downhole geophysical (UTEM) surveys and detailed surface mapping. The two holes were extended to determine the thickness of the dike and to allow for downhole geophysical surveying. Both holes encountered additional zones of disseminated sulphides within inclusion-bearing phases of the offset dike (Champion Bear Resources, press release, September 3, 2003).

Within diamond drill hole BS-16-02, an 11.8 m section from 317.8 to 329.6 m encountered 0.5 to 2% disseminated sulphides including pyrrhotite, pyrite and minor chalcopyrite. BS-16-02 also encountered disseminated sulphide mineralization from 154 to 249 m (Champion Bear Resources, press release, May 7, 2003).

Diamond drill hole BS-18-03 traced the anomalous, disseminated-sulphide-bearing, inclusion-rich portion of the Parkin Offset dike to a vertical depth of 700 m (Champion Bear Resources, press release, September 3, 2003). The section from 476 to 521 m contained sporadic blebs of sulphide mineralization in inclusions up to 3 x 5 cm (Champion Bear Resources, press release, May 7, 2003). The recent downhole UTEM survey identified a small in-hole conductor in hole BS-18-03 at approximately 710 m depth, interpreted as being due to the strongly magnetic upper portion of the serpentinized unit (Champion Bear Resources, press release, September 3, 2003). Drill hole BS-18-03 also encountered several narrow quartz-epidote veins and silicified zones with anomalous gold mineralization up-hole from the zone of disseminated sulphides. The 0.4 m section of core from 368.45 to 368.85 m assayed 1430 ppb Au, and the 0.4 m section of core from 393.55 to 393.95 m assayed 289 ppb Au and 1775 ppm Cu (Champion Bear Resources, press release, May 7, 2003).

Diamond drill hole PN-03-03 was drilled to test an IP anomaly located 150 m east of the offset dike, east of hole PN-02-03. Mineralization was limited to anomalous gold values found in a 4 m section of altered gabbro from 18.0 to 22.0 m, which contained 3 to 10% disseminated fine-grained arsenopyrite locally (Champion Bear Resources, press release, May 7, 2003).

Iron Mask Property

Champion Bear has continued its geological mapping program on the central portion of the Iron Mask claims west of Cartier, Ontario. This is part of a 135 km mapping and ground geophysical program to evaluate the potential of this property to host Olympic Dam style mineralization. Mapping to date has been able to trace a highly magnetic skarn zone, intermittently, along a strike length of almost 3 km. The Cobalt Shaft showing is located along this skarn zone. Two grab samples collected by Champion Bear in 2002, from a shear cutting the skarn zone, returned greater than 10% Co, 8.4% Ni and 3.5% Cu (Champion Bear Resources, press release, June 25, 2003).

Thin section petrographic examination has confirmed two new outcrop areas of Sudbury breccia. The two outcrops are approximately 2.3 km apart and lie along a northeast trend. Structural studies and drilling are underway to determine if this may be the extension of the Hess offset trend (Champion Bear Resources, press release, September 3, 2003).

Crowflight Minerals Incorporated

Crowflight Minerals is currently focused on three properties located in the Sudbury Basin: the AER-Kidd property is located on the Worthington Offset nearby Inco's Totten and McIntyre mines; the Airport property is located on the southeast rim of the Basin about 1.2 km east of Falconbridge's past producer, Norduna Mines; and the Marble Mountain prospect is on the western extension of the Parkin Offset.

AER-Kidd Property

Crowflight's first core drill hole (W03-01) drilled into the Worthington Offset intersected disseminated sulphide mineralization. This hole, drilled near the AER-Kidd/Inco Totten boundary, targeted a previously known borehole (U09-E23) intersection completed in the mid 1960's. The borehole intersected 80 m of the Worthington Offset Dike containing over 40 m of mineralized quartz diorite. The more mineralized centrally located section of inclusion-bearing quartz diorite, from 928.4 m to 934.87 m, yielded an average of 0.195% Cu, 0.186% Ni, with the highest PGM assaying combined 1.2 g/t (Crowflight Minerals, news release, December 5, 2003). All mineralization occurs within the Quartz Diorite offset dike with massive lenses of Ni-rich sulphide surrounded by Cu-rich stringer mineralization within a wider disseminated sulphide halo (Crowflight Minerals, news release, December 10, 2003). Detailed field mapping along the western boundary adjacent to Inco's Totten property has revealed the presence of massive chalcopyrite veins (Crowflight Minerals, news release, September 16, 2003).

Anomalous time-domain electromagnetic responses were detected in borehole W03-01 from a depth of 700 m to the end of the hole at 950 m. The responses indicate an in-hole or near-hole multiple conductor response typical of local stringer sulphide mineralization. A relatively strong off-hole, lateral response was also measured, suggesting a massive or semi-massive sulphide body is in the vicinity of the hole and apparently beyond the hole. This response is likely coincident with the strong magnetotelluric (MT) anomaly (Crowflight Minerals, news release, December 10, 2003).

Airport Property

Recent deep-penetrating IP geophysics survey has outlined several distinct anomalies. The geophysics survey was structured to investigate a model target of massive sulphide in the Sudbury Basin footwall rocks at the Airport Property, located just outside the east rim of the SIC (Crowflight Minerals, news release, October 7, 2003).

Marble Mountain Prospect

Marble Mountain Prospect covers a 6.5 km strike length of the western extension of the Parkin Offset. Work by Crowflight's exploration personnel has identified a potentially significant extension of the Parkin Offset along a west-northwest-trending radial offset dike. Two grab samples of massive to semi-massive chalcopyrite in quartz diorite exposed in an old pit on the property returned Pt values of 19.9 g/t and 13.0 g/t; Pd values of 0.65 g/t and 8.7 g/t; and Au values of 0.02 g/t and 2.68 g/t, respectively. Mineralization is also widespread in quartz veins in the wallrock quartzites and marbles south of the quartz diorite body. Grab samples of this mineralization with high sulphide content returned significant values of Au ranging from 3.28 g/t to 19.1 g/t (Crowflight Minerals, news release, December 16, 2003).

FNX Mining Company Incorporated and Dynatec Corporation – Sudbury Joint Venture

A significant amount of diamond drilling was conducted at the McCreedy West, Levack, Norma and Victoria mines. Geological descriptions are posted on the company's website (www.fnxmining.com) and in Cosec et al. 2003.

Hedman Resources Limited

Hedman Resources Limited announced the placement of a "Letter of Intent" in which Perlite Canada Inc. hopes to purchase the first 4000 tons of horticultural grades of vermiculite ore from Hedman's soon to be acquired mining and processing facilities (Hedman Resources Limited, press release, December 12, 2003). Hedman currently produces and sells vermiculite, a low-density, biologically inert product with a chemically active surface used as an additive, filler, absorbent, fertilizer and soil cover in a number of industry end-user applications (Hedman Resources Limited, press release, December 12, 2003).

The Cardib vermiculite deposit comprises 6 claims totaling 17 units of approximately 40 acres each (680 acres) and other unpatented claims. Inspection of the grounds disclosed numerous indicators that many additional vermiculite veins snake through this property (Hedman Resources Limited, press release, December 4, 2003). Preliminary testing of the vermiculite ore from the Cardib deposit is promising, as it appears to be asbestos-free vermiculite. A bulk sample of vermiculite ore was submitted to a mineralogy laboratory for mineralogical examination and identification of asbestos mineral phases. The sample was found to consist primarily of vermiculite, chlorite and minor hematite, with no evidence of fibrous or asbestos minerals (Hedman Resources Limited, press release, December 24, 1996).

JML Resources Limited

JML Resources Limited can earn a 50% interest in the Scadding Gold Property from Currie Rose Resources. The 256 hectare property is located approximately 50 km northeast of Sudbury in Scadding Township. During the 1980's, limited production of 140 000 tons grading 0.21 ounces of Au were extracted from four shallow zones on the property (www.jmlresources.com).

JML Resources Limited completed its first phase of diamond drilling and geophysics in the North Target Zone area and the East West zone. These areas encompass two of four known gold occurrences on the property. The program was designed to further test the existence, continuity, and grade of gold, as well as the thickness of the host stratigraphy.

An eleven-hole, 1405 m diamond drilling program was completed in 2003. Gold mineralization occurs together with iron-rich sulphides in east-trending, chlorite-rich, brecciated shear zones. Alteration of the host rocks includes carbonatization and albitization.

The geophysical program included a detailed magnetic survey as well as induced polarization surveys. The survey results identified an extension of the known zones, as well as additional targets in the remaining two zones for the next phase of diamond drilling (JML Resources Limited, press release, December 16, 2003).

Mustang Minerals Corporation

Throughout 2003, Mustang Minerals focused on the acquisition and exploration of high potential Ni-Cu-PGE properties in the Sudbury area. Properties include the Hyman Township nickel property, the Nairn Township nickel property, the East Bull Lake and River Valley properties, and the Manchester Nickel property (www.mustangminerals.com). They also acquired partial interest in the Scadding Gold Property (see JML Resources Limited).

Hyman Township Nickel Property

Located west of Sudbury. Phase one diamond drilling is to evaluate the property in order to target Ni-Cu-PGM mineralization. Three holes were drilled and sections of up to 0.25% combined Ni + Cu were intersected. Mustang terminated the option on the portion of the property that was drilled (Mustang Minerals Corporation, press release, October 20, 2003).

Manchester Nickel Property

The Manchester Nickel Property was optioned from Inco Ltd. The property includes a 2.5 km section of the Manchester Offset Dike, one of three known offset dikes on the south range of the Sudbury Igneous Complex. Intermittent exploration by Inco in the 1970's included a reconnaissance diamond drilling program, which intersected nickel mineralization in several drill holes. Phase one drilling by Mustang was undertaken to test for nickel and platinum group metals in areas where mineralization was previously encountered. A comprehensive geophysical program was completed by Quantec, as well as reinterpretation of all historical geophysical data. A second phase diamond drilling program over the offset dike followed. Results were not posted in 2003 (Mustang Minerals Corporation, press release, November 10, 2003).

Namex Explorations Incorporated

Namex Explorations Incorporated has several properties in the Sudbury Basin: the Woods Creek and Totten properties located on the western part of the SIC; and the Black Creek, Terra Incognita, Golden Pine and Post Creek properties situated on the northeast part of the SIC (http://namex-explorations.com).

Woods Creek

The Woods Creek property consists of 56 claim units located in Hyman Township. The property has four sulphide occurrences in Nipissing diabase; three of these are old pits showing chalcopyrite and pyrrhotite with anomalous indications of platinum and palladium. A new, 2 to 3 m wide sulphide showing, containing sections of massive and disseminated pyrrhotite and chalcopyrite mineralization, was recently revealed by blasting. The sulphides are nickel bearing. Woods Creek property outcrop samples assayed 1.22% Cu, 0.95% Ni with anomalous PGM contents. Diamond drill hole WCB intersected 23 feet of mineralized Nipissing diabase with assay values up to 1.09% Ni, 0.37% Cu and 329 ppb combined Pt+Pd. Drill hole WCC intersected 14 feet of mineralization in altered diabase, assaying up to 0.16% Ni, 0.19% Cu and 169 ppb combined Pt+Pd+Au (Namex Explorations Incorporated, press release, January 20, 2003).

Black Creek Property

The Black Creek property consists of 94 claim units located in Parkin and Hutton townships. Within the Black Creek property, there are extensive gold + arsenic anomalies in tills and soils. Both gold and base metal occurrences are documented on the property as well as numerous occurrences of placer gold in the tills. Morphology of gold grains in till suggests they are locally derived. A pronounced circular magnetic high covered with 15 m of glacial till is also being investigated. Preliminary assessment of the mineral potential of the Black Creek property has revealed an extensive alluvial type gold occurrence on the property. A reconnaissance soil geochemical survey over part of this deposit has returned significant gold and palladium results (Namex Explorations Incorporated, press release, October 16, 2003).

Terra Incognita

The Terra Incognita property consists of 41 claim units located in Parkin Township. A ground magnetometer and VLF survey was completed in 2003 revealing several conductors with strong cross-overs that are indicative of a bedrock source and that have some corresponding magnetic features. No outcrop is available for mapping and sampling due to overburden cover and low, swampy ground. Soil geochemical MMI surveys have been conducted (Namex Explorations Incorporated, press release, October 16, 2003).

Golden Pine

The Golden Pine property consists of 38 claim units located in Parkin Township. Namex is folding together the Black Creek and Terra Incognita properties into the Golden Pine. The combined properties will be 6920 contiguous acres, over 8 square miles, covering a 17 km long by 3 km wide Archean greenstone belt with gold occurrences at both ends. Thirty-seven samples of mineralized rock, collected from trenches and blasted outcrop from an area approximately 2500 feet by 850 feet, were assayed. These assays include values of 0.09, 0.14, 0.29, 0.54, 0.56, 0.62, and 1.286 oz. gold per ton (Namex Explorations Incorporated, press release, October 16, 2003).

Post Creek and Post Creek East Properties

The Post Creek property consists of 24 claim units and the Post Creek East property consists of 11 claim units. Both are located in east Norman Township. Recent work has verified that the ore-hosting formation of the Whistle Offset continues in a northeasterly direction onto the Post Creek properties.

On the west end of the Post Creek property a ground magnetometer survey, prospecting, geochemical sampling and overburden stripping has been completed over previously identified airborne magnetic and electromagnetic anomalies. Results indicate these geophysical anomalies are related to a north-trending zone of silicification developed within massive basalt and gabbro. These rocks contain 1-5% disseminated pyrrhotite and chalcopyrite at the northern portion, and 1-5% disseminated and veinlet chalcopyrite and sphalerite in the southern portion. Up to 1% disseminated pyrrhotite is present along the entire 200-metre trend. MMI soil geochemical survey results indicate the North Anomaly is characterized by anomalous gold, nickel, cobalt and palladium in overlying soil (Namex Explorations Incorporated, press release, November 4, 2003).

On the Post Creek property, Namex assayed 156 core samples from diamond drill holes PC-1, PC-2 and PC-3. These diamond drill holes are hosted by medium-grained gabbro; Sudbury breccia with gabbro fragments containing 30% disseminated pyrite with lesser chalcopyrite; and altered gabbro crosscut by quartz-epidote stringers and patches with up to 5% disseminated pyrite and rare chalcopyrite. Drill holes PC-1 and PC-2 encountered silicified and sericitized andesite with up to 5% disseminated pyrite. A 20-foot mineralized interval in hole PC-1 assayed 0.03% Cu, 41 ppb Au and 28 ppb Pt + Pd. Drill hole PC-2 intersected a 77-foot mineralized interval with up to 5% disseminated pyrite and lesser chalcopyrite. Values of up to 0.02% Cu, 0.03% Pb and 30 ppb Au were obtained from assays (Namex Explorations Incorporated, press release, March 6, 2003).

Pacific North West Capital Corporation

Pacific North West Capital Corp. is an exploration company focused on the discovery of platinum group metals. PFN is currently exploring the River Valley Project (joint ventured with Anglo American Platinum Corporation Limited) and the Agnew Lake Project, currently under option to Anglo Platinum (www.pfncapital.com).

River Valley

PFN's main project is the River Valley Project. The River Valley property is located in Dana Township and in the southwest corner of Pardo Township, about 20 road km northwest of the village of River Valley. The property covers most of the northern portion (northern contact and main body) of the intrusion and represents the largest single land-holding and exploration budget for all of PFN's properties.

The River Valley property is primarily underlain by rocks of the River Valley Intrusion, a large, layered mafic intrusion that covers more than 100 km and consists primarily of pyroxenite, melagabbro, gabbro and leucogabbro with subordinate anorthosite, gabbronorite and troctolite. The property covers most of the northern contact of the River Valley Intrusion and all of a northern offshoot of the main body of the intrusion. Most of the known mineralization occurs as disseminated and bleb sulphides (chalcopyrite dominated) within a heterogeneous rock package that is proximal to the country rocks or margin of the intrusion (side-wall and/or footwall rocks). This heterogeneous rock package includes melanocratic to leucocratic breccias and pegmatitic to vari-textured breccia zones.

The River Valley property includes two main mineralized areas with anomalous PGM (Pt+Pd+Rh), Au, Cu and Ni sulphide mineralization: the Dana Lake Zone and Azen Creek Zone. The Dana Lake Zone is located within the northwest corner of the claim group and consists of 4 discovery areas, viz. north to south: Road zone, North zone, Trench zone and South zone. These 4 zones of PGM-Cu-Ni mineralization represent a strike length of greater than 700 m. The Azen Creek Zone is located about 6 km southeast of the Dana Lake Zone and consists of one discovery area (Main showing) (Pacific North West Capital Corp., news release, October 29, 2003).

Drill hole DL-154, collared in the Dana Lake South Deposit, intersected 5.02 g/t Pd+Pt over 47 m (154 ft), the highest grade intersection to date. This mineralized zone in the marginal breccia unit is bracketed by above average grade mineralization, shows consistently high values, and is open to depth. The total mineralized intersection was 68 m @ 3.72 g/t Pt+Pd (Pacific North West Capital Corp., news release, September 8, 2003).

Pacific North West Capital Corp. reports further PGM values have now been intersected in numerous initial drill holes collared in the area lying between Dana North, at the north end of the River Valley Property and Azen Creek, a 6 km strike length. Outstanding assays from Dana Lake are also reported. The discovery of mineralization within each of the new zones is consistent with the geological target defined in the Dana Lake/Lismer's Ridge area. The PGM mineralization is associated with sulphide minerals mainly within the marginal breccia unit of the River Valley Intrusive (Pacific North West Capital Corp., new release, November 19, 2003).

A significant new zone of mineralization has been delineated on the River Valley PGM Property. Hole VA-01 intersected 73 m (239 ft) of 1.52 g/t PGM including 23 m (75 ft) of 2.2 g/t PGM. The mineralization is centred on the Varley Zone located 3 km south of the Lismer's Ridge area. PFN has known for some time that higher platinum and palladium values (>10 g/t PGM) outcrop in gabbroic breccias in the Varley Zone (Pacific North West Capital Corp., news release, October 29, 2003).

Agnew Lake

The Agnew Lake property is located in Shakespeare, Dunlop, Shibananing and Gough townships, about 60 km west of Sudbury. The property overlies the Agnew Lake layered mafic intrusion. This intrusion is similar in age and composition to the River Valley Intrusion and, like the River Valley Intrusion, carries substantial PGM values in contact-associated magmatic breccias close to the intrusive contact. The Agnew Lake Intrusion is exposed as a crudely elliptical body measuring roughly 10 km by 6 km, with its long axis trending about 110°.

The complex is hosted by sulphur-poor granitic rocks of the Algoman Granitoid Suite, and the intrusion is overlain by Matinenda Formation conglomerate, which forms part of the lower sedimentary sequence in the Huronian Supergroup. Post-emplacement faulting and late emplacement of mafic dikes and/or sills generally obscure the contact relations at the base and along the exposed contact of the complex. The Agnew Lake Intrusion is apparently connected to the East Bull Lake Complex by the Streich dike, which is generally interpreted as the initial feeder to both intrusions (Vogel 1996).

Available geological mapping in the vicinity of the recently identified conductors indicate they are located at or near the contact of the Agnew Intrusion, in an area not previously explored by the joint venture. A number of younger mafic dikes are also present in close proximity to the two conductors, which are both overburden covered. The stronger of the two conductors is located 400 m northwest of a known Pt-Pd showing, which has returned grades of

up to 15.6 g/T Pt+Pd, hosted within one of the younger (Nipissing) dikes (Pacific North West Capital Corp., news release, December 15, 2003).

Initial follow-up prospecting by PFN has resulted in the discovery of a narrow, high-grade zone of Au-Ag mineralization located in close proximity to one of the two EM conductors. Grab samples from the discovery showing of the new "V" zone returned Au values ranging from 156 ppb to 76.2 g/t (2.45 ounces Au per tonne) and 0.7 to 206 g/t Ag (6.62 ounces Ag per tonne). The precious metal mineralization is associated with a sulphide-bearing quartz vein system located along the contact between a gabbro dike and argillaceous sediments 140 m from the interpreted center of the Spectrum Airborne EM anomaly (Pacific North West Capital Corp., news release, December 15, 2003).

Temex Resources Corporation – Wilson Lake Project

The Wilson Lake project is comprised of 1244 claim units, totaling over 20 000 hectares, all within a 25 km radius of Temagami, Ontario and owned 100% by Temex. The property was recently freed from a thirty-year staking ban imposed by the "Temagami Land Caution". The Wilson Lake project lies entirely within the Lake Timiskaming Structural Zone, a major, deep-crustal feature that is host to more than 50 kimberlites over a strike length of 300 km. Temex completed a combination of Mobile Metal Ion (MMI) soil geochemical surveys, airborne and ground geophysical surveys, and Kimberlite Indicator Mineral (KIM) geochemical till sampling. In addition, a recently completed GIS-based, multi-parameter compilation of existing data has outlined 10 major areas of priority interest for on-going diamond exploration. Previous till sampling by Temex on the Wilson Lake project returned values of up to several hundred KIM's per 10 kg till sample, as well as a significant number containing G10 garnets. Background KIM counts in the area range from 1 to 3 KIM/10 kg sample. The objective of the current field program is to obtain additional information on areas of interest and KIM dispersion trains, and to examine potential source locations in the field. An airborne magnetic/EM survey at 50 m line-spacing has recently been flown over the highest priority area that contains numerous KIM anomalies. A diatreme breccia complex and related system of lamprophyre dikes that have petrographic and mineralogical affinities to the diamond-bearing rocks from the Wawa region is also being mapped and sampled as part of the current program (Temex Resources Corporation, news releases, February 26, 2003 and November 4, 2003).

Based on a combination of gold grain data from previous till sampling surveys (industry and government) and regional structural analyses, seven empirical gold targets worthy of further work have been targeted. The highest priority target has three anomalous till samples collected by Temex proximal to an east-northeast-trending shear zone, which contained from 16 to 138 pristine gold grains and from 40 to 187 total gold grains. These totals are considered to be highly anomalous and indicative of a local bedrock source. A number of multi-gram gold intersections in drilling have been obtained by previous exploration programs in the region, confirming the overall gold potential of the area (Temex Resources Corporation, news release, November 4, 2003).

Tres-Or Resources Limited

Tres-Or Resources Ltd. has substantial land packages centered around the village of Temagami in northeastern Ontario. The Temagami Diamond Claim project consists of 100 000 hectares of contiguous claim units covering part of the Archean Superior Craton, and extends south across the Grenville Front into the Grenville Parautochthonous Belt. The area exhibits many major north- to northwest-trending faults and lineaments (associated with the Timiskaming Structural Zone) that intersect major east- to northeast-trending structures.

The Temagami Diamond Claim project area contains diamond potential indicators such as sub-calcic G10 Cr-pyrope garnets, eclogitic garnets and Cr- and Mg-rich chromites, and is in close proximity to deep-seated geologic structures that are believed to be associated with kimberlite emplacement. Recent airborne magnetic surveys outline a number of discrete kimberlite-type anomalies that correlate with indicator chemistry.

Compiled kimberlite indicator mineral (KIM) counts from Tres-Or's work programs, which included the collection and processing of over 600 till samples, has confirmed at least four KIM dispersion trains occur in different parts of the Temagami Diamond Claim. Tres-Or's sampling confirm these indicator trains include good indicator mineral

chemistry suggestive of diamond-bearing kimberlite sources. The indicator mineral surface textures suggest that at least some of the KIM train sources likely originate on Tres-Or's claims (http://www.tres-or.com).

United Reef Limited

United Reef Limited is exploring for a Ni-Cu-PGE deposit on the Nickel Offsets property on the Foy Offset, 40 km northwest of Sudbury. The Nickel Offsets property hosts the Nickel Offsets Mine, which produced 208 000 tons of Ni-Cu ore between 1943 and 1957 through two shafts, with reported recoveries of 4.56 million pounds of Ni and 3.32 million pounds of Cu. United Reef has previously confirmed the presence of significant values for PGM's in material mined on the property.

United Reef Limited announced the results of its initial Time Domain Induced Polarization (IP) reconnaissance survey carried out on the Nickel Offsets Property. The company acquired eight lines of chargeability and resistivity data covering 6.9 line km across portions of the Foy Offset, quartz diorite and quartz diorite breccia dike. Interpretation of the survey results identified conductors to a depth of 100 to 125 m. New chargeability anomalies, outside of the former mine's workings, have been identified at 3 locations:

• 3+00 E, 1+50 N: broad chargeability high near surface, steeply dipping to north, on hangingwall side of the Foy Offset dike (Shaft 2 area).

• 13+00 W, BL0: 50-m wide chargeability anomaly at a depth of 90 m; possible updip extension of previously mined ore lens (west of Shaft 1).

• 16+00 W, 1+00 S: narrow source located at a depth of 35 m on hangingwall side of the Foy Offset dike (west of Shaft 1).

Targets for drilling include these new IP anomalies and possible remnant blocks of mineralization within the existing mine workings (United Reef Limited, press release, February 5, 2004).

Ursa Major Minerals Incorporated

Ursa Major Minerals' Sudbury area projects are located in Shakespeare, Porter, Baldwin and Hyman townships, west of Sudbury, comprising approximately 303 claim units (www.ursamajorminerals.com). Ursa has earned a 75% interest from Falconbridge Limited in the Shakespeare property. The Shakespeare property hosts Ni-Cu-PGE mineralization in a mafic intrusion dike related to the Sudbury Igneous Complex. A sample submitted to the Geochronology Laboratory of the Royal Ontario Museum yielded an age of 2217 Ma. This age is significantly older than the age of the Sudbury Igneous Complex but is similar in age to Nipissing intrusions. Based on successful exploration at the Shakespeare deposit, Ursa Major has developed an exploration target for Ni-Cu-PGE mineralization in Nipissing age (ca. 2.22 Ga) mafic intrusions located near the southern boundary of the Archean Superior geological province (Ursa Major Minerals, press release, August 21, 2003).

Nickel-copper-PGM mineralization at the Shakespeare deposit has been identified over a strike length of over 1100 m, and the deposit remains open on strike and at depth. As of November 24, 2003, Ursa Major had completed 50 holes for 9300 m on the project (Ursa Major Minerals, press release, November 25, 2003). An Indicated Resource of 4.87 million tonnes grading 0.43% Ni, 0.43% Cu, 0.03% Co, 0.22 g/t Au, 0.41 g/t Pt and 0.45 g/t Pd has been defined over a 300 m strike length in 2003 (Ursa Major Minerals, press release, December 17, 2003). The Shakespeare property has a near-surface Inferred Resource of 2.1 million tons grading 0.36% Ni, 0.42% Cu, 0.44 g/t Pd, 0.40 g/t Pt, and 0.22 g/t Au (www.ursamajorminerals.com).

Diamond drilling has delineated one major zone of near-surface, disseminated to net-textured sulphide mineralization. Twenty-two (22) intersections reported to date have a length-weighted average grade of 0.47% Ni, 0.49% Cu, 0.03% Co, 0.45 g/t Pt, 0.50 g/t Pd and 0.25 g/t Au with average width of 131 feet (40 m) (Ursa Major Minerals, press release, April 30, 2003). Drill highlights include hole U3-30 that intersected 57.3 m grading 0.42% Ni, 0.44% Cu, 0.03% Co, 0.25 g/t Au, 0.40 g/t Pt and 0.48 g/t Pd. This intersection included 9.7 m of 0.67% Ni,

0.46% Cu, 0.05% Co, 0.26 g/t Au, 0.47 g/t Pt and 0.42 g/t Pd (Ursa Major Minerals, press release, November 25, 2003).

Metallurgical test work carried out at SGS-Lakefield Research Limited on drill core samples from the Shakespeare deposit provided initial estimates of base metal recoveries and evaluation potential concentrate grades. Test work was completed on two composite samples obtained from drill holes U3-08 and U3-09. Sulphide minerals are mainly pyrrhotite with lesser chalcopyrite and pentlandite. As a base case, open circuit recoveries for a concentrate grade of 22.2% Cu + Ni are 93.5% for Cu and 68.8% for Ni. Recoveries for platinum were 68.7% in the base case (Ursa Major Minerals, press release, December 4, 2003).

Ursa Major recently completed a borehole electromagnetic (EM) survey of 11 drill holes at the Shakespeare deposit, which has successfully identified conductive targets on-strike and down-dip from the known deposit. The most significant target is a strongly conductive source extending northeast from the deposit. This conductor appears to be an extension of a higher-grade zone of mineralization identified in several recent drill holes. The three-dimensional pulse time-domain EM borehole survey was conducted by Crone Geophysics and Exploration Ltd. using a Crone Pulse EM system, which identified a long wavelength anomaly at the west end of the deposit (Ursa Major Minerals, press release, December 17, 2003).

Spectral induced polarization (IP)/resistivity and magnetometer surveys conducted by JVX Ltd. have resulted in several high priority drill targets located in prospective geological settings along strike to the east of the Ni-Cu-PGE discovery on the Shakespeare property. In particular, JVX Ltd. has identified anomalies with a strong spectral IP and coincident magnetic response located east of the area of current drilling and in Baldwin Township east-northeast of the current drilling. The target in Baldwin Township was tested with two short diamond drill holes and assays indicate a narrow zone of strongly anomalous PGM mineralization with values up to 1.7 g/t Pt and 0.7 g/t Pd over 0.8 m (Ursa Major Minerals, press release, August 21, 2003). Recent spectral IP and time-domain electromagnetic (TDEM) geophysical surveys indicate that an anomaly extends for at least a further 240 m east of the area of current drilling (Ursa Major Minerals, press release, April 8, 2003).

Wallbridge Mining Company Limited

Wallbridge Mining Company Limited currently has 24 footwall contact properties on the Sudbury Igneous Complex (SIC) including their Windy Lake, Milnet, Worthington and Wisner properties. In total, these properties cover over 250 km^2 of SIC. Wallbridge Mining's Sudbury area properties are the basis for joint venture agreements with Lonmin Plc. and Falconbridge Limited.

Windy Lake

Geophysical survey data incorporated into a 3-D modeling tool with a geological data model illustrated a 'trough' within the Windy Lake embayment on the north rim of the SIC. A highly conductive anomaly detected to the east of diamond drill hole WL-009 is situated within this trough-shaped structure (Wallbridge Mining Company, press release, January 9, 2003). Geochemical results from drill holes WL-003, WL-006 and WL-009 within the embayment contain anomalous (> 0.3% Cu + Ni) values, with metal content increasing toward the conductive body above WL-009 (Wallbridge Mining Company, press release, April 14, 2003).

Wallbridge reports that diamond drill hole WL-009B has confirmed the presence of copper- and nickel-bearing sulphide mineralization associated with the conductive anomaly under Windy Lake. The hole intersected several zones of disseminated to net-textured pyrrhotite (+/- chalcopyrite) mineralization within a thickened portion of sublayer, the basal unit of the SIC. Sulphide contents generally range between 3% and 15%, with local sections containing in excess of 30% sulphides over widths of approximately 0.5 m. Sections of the mineralization are conductive, and it is believed that this wide zone of mineralization and multiple conductive zones represent a component of the conductive anomaly observed from hole WL-009. Mineralization intersected in this hole sits 15 to 80 m above the contact of the SIC. Assay results from hole WL-009B range up to 0.99% Cu + Ni (0.52% Cu, 0.47% Ni). Total Cu + Ni contents show an increase of 73% from hole WL-009 to WL-009B. The increase in

sulphide and nickel-copper content indicates an east-southeasterly trend for the mineralized sublayer embayment and provides a vector for further exploration (Wallbridge Mining Company, press release, June 19, 2003).

Milnet Property – Parkin Offset

The Milnet property is located on the Parkin Offset dike, on the northeast corner of the Sudbury Basin. The Parkin Offset is believed to be the faulted extension of the Whistle Offset, which hosts the Whistle Mine and FNX's Norman Project. On the Milnet property, drilling will target the down-plunge extension of the Number 2 zone at the past-producing Milnet Mine. This mine was in operation in the late 1940s and early 1950s and produced 157 130 tons @ 1.49% Ni, 1.54% Cu, 2.25 g/t Pt and 2.98 g/t Pd. High-grade intersections in two old underground drill holes returned 1.34% Cu and 3.43% Ni over 1.5 m core length in hole 4-121; 5.31% Cu and 10.07% Ni over 0.3 m core length in hole 4-128; and 1.10% Cu and 1.17% Ni over 0.4 m core length in hole 4-128 (the holes were not assayed for PGEs). These intersections are located in a pinched section of the dike, which represents the down-plunge extension of the structural feature that hosted the Milnet No. 2 zone (Wallbridge Mining Company, press release, May 28, 2003).

Worthington Property

At the Worthington property, trenching of a new occurrence of quartz diorite offset dike, discovered by Wallbridge geologists during reconnaissance mapping, exposed disseminated nickel-copper mineralization over a strike length of 600 m. Regional work by Wallbridge geologists appears to confirm that this dike, referred to as the Mystery Offset further to the southwest, is actually the faulted extension of the prolific Worthington Offset. Values in the trenches range up to 0.19% Cu, 0.18% Ni and 0.57 g/t Pt + Pd + Au in material containing about 5% sulphides (Wallbridge Mining Company, press release, September 17, 2003).

Wisner Property

Wallbridge Mining Company Limited announced the discovery of high grade Pt + Pd footwall mineralization on its Wisner property, located on the North Range of the Sudbury Basin. Initial channel sampling results from two recently stripped areas located approximately 40 m apart have returned high grade Pt, Pd and Au values. Two distinct styles of mineralization are present. The first consists primarily of narrow fracture fills, stockworks and disseminations of chalcopyrite+/-pentlandite- millerite in a low-sulphide-bearing unit. The second style, hosting values of up to 15.81 g/t Pt+Pd+Au in material with very low sulphide contents (0.09% S) occurs at the limits of current sampling. Ownership of the Wisner property is 55% Wallbridge and 45% Falconbridge Limited (Wallbridge Mining Company, press release, September 30, 2003).

RESIDENT GEOLOGIST STAFF AND ACTIVITIES

In 2003, M. Cosec, District Geologist; District Support Geologists D. Farrow and M. Gaudreau; and Acting District Support Geologists S. Beachamp and J. Selway staffed the Sudbury District Geology office. L. Sikora and J. Millan provided office and field assistance under the Summer Experience Program.

The District Geologist completed his term as councillor with the Association of Professional Geoscientists of Ontario and successfully completed the Professional Practise and Ethics examination. He continued to serve as the mineral industry representative on the area team of the Regional Economic Development Branch, Northern Development Division, MNDM. He also continued to provide input to the Paleozoic Working Group of the Ontario Geological Survey.

M. Cosec attended the annual Prospectors and Developers Associated of Canada meeting in Toronto, the Northeast Regional Geoscience Symposium in Haileybury, and the Ontario Prospectors Association Geoscience Symposium in Toronto.

Staff contributed to and provided assistance to the MNDM corporate display at the annual Sudbury Gem and Mineral show in July. Field trips of the Sudbury Structure were provided to a variety of academic groups and individuals throughout the year. Over 3000 telephone and office enquiries were handled by office in 2003.

Table 5. Property visits conducted by the Sudbury District office in 2003.

Number (keyed to Figure 5)	Property / Occurrence	Township	Commodity
1	Tearlach Resources Ltd.	Lorne	Ni, Cu, PGE
2	Crowflight Minerals Inc.	Totten	Ni, Cu, PGE
3	Ike Burns Exploration Corp.	Venturi	diamonds
4	H. Wier	Gilbert	Pb, Zn
5	Inco Limited	Levack	Ni, Cu, PGE
6	Falconbridge Limited (Craig Mine)	Levack	Ni, Cu, PGE
7	Wallbridge Mining Company Limited	Parkin	Ni, Cu, PGE
7	Ike Burns Exploration Corp. (Erana Quarry)	Parkin	dimension stone
8	Pacific North West Capital Corp.	Dana	PGE
9	J. Bennett	Pringle	garnet
10	P. Martel	Drury	silica
11	Wolverine Explorations	Davis	silica
12	Moose Mountain Mine	Hutton	ballast
13	Morton Lake area	Roberts	trap

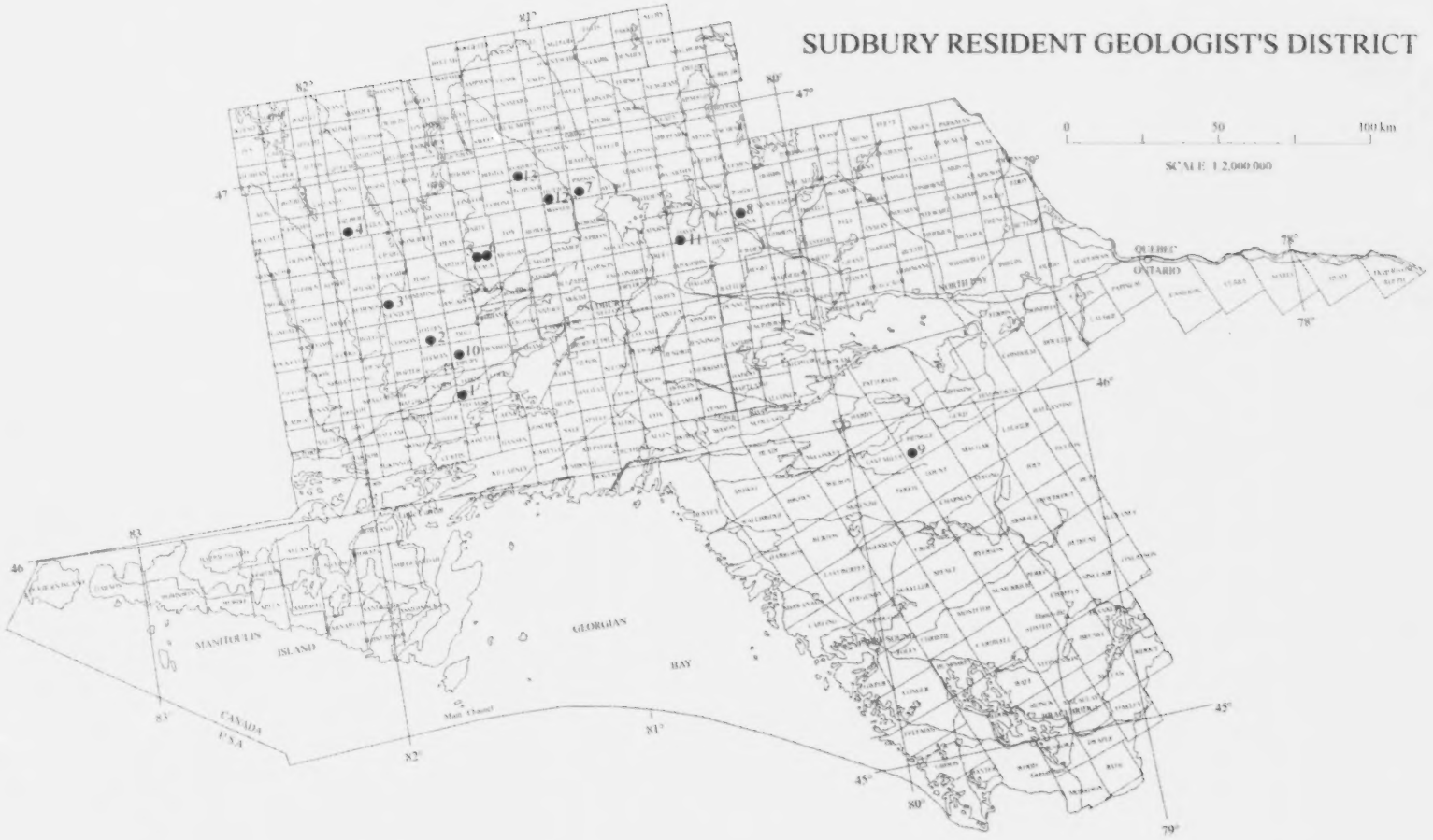

Figure 5. Property visits conducted by the Sudbury District office in 2003 (keyed to Table 5).

PROPERTY EXAMINATIONS

Wolverine Exploration Silica Property

D. Hanes discovered high-purity silica in hydrothermal quartz veins in Davis Township in June 2003. The property is located in Lot 2, Concession 1 on claim 1199037 (Figure 6). Access to the property is via the old North Road from Markstay on Highway 17 East, to Crearer Road into Davis Township, then follow the north branch road to the property. Traversing east off the road within claim 1199037, the quartz outcrops (Photo 1) are visible at the bottom of the grade near location 536146E / 5164344N (NAD83), UTM Zone 17.

The quartz vein (stripped areas Q2 to Q5), on the north flank, has a well-defined contact with chlorite schist and its dip is nearly vertical. From stripped area Q1 to Q6, the quartz vein is approximately 175 m long, and is 5 to 7 m wide at the east end of Q2. True width has not yet been determined because of thick overburden. A rock chip from the quartz vein was collected at each stop and the 6 pieces were combined as one sample (Davis Q1-Q6) (see Table 6). Geochemical analysis showed that this sample contains 99.67 wt% SiO_2.

A second quartz vein, located to the east of the beaver dam (see Figure 6), also intrudes chlorite schist. The quartz vein forms a ridge that is 7 m high above the marsh (Photo 1, left). This quartz vein is exposed over 35 m, across a width of 5 to 8 m. The trend is approximately 070° NE. The vein is open to the southeast as the overburden is thick.

The old shaft (see Figure 6) is about 4.5 m deep and exposes a quartz vein which contains emerald green carbonate. There is a large amount of white quartz scattered around the outside of the shaft.

The two quartz veins have been stripped by hand and assayed. Power stripping is needed to more accurately determine the width of the quartz veins and drilling is needed to determine their depth extent.

Table 6. Composition of samples from the quartz veins on the Wolverine Exploration Silica Property.

Sample # (Detection Limit)	SiO_2 wt% (0.01)	TiO_2 wt% (0.01)	Al_2O_3 wt% (0.01*)	Fe_2O_3 wt% (0.01)	MnO wt% (0.01)	MgO wt% (0.01)	CaO wt% (0.01)	Na_2O wt% (0.01)	K_2O wt% (0.01)	P_2O_5 wt% (0.01)	LOI wt% (0.05)	TOTAL wt% (n/a)
Davis Q1 – Q6	99.67	N/D	0.06*	0.01	N/D	N/D	N/D	N/D	N/D	0.02	0.08	99.75
Davis 191 Q1	99.43	N/D	0.67**	0.02	N/D	N/D	0.01	N/D	N/D	N/D	0.14	100.24
Davis 197 Ridge	99.58	N/D	0.85**	N/D	N/D	N/D	N/D	N/D	0.02	N/D	0.12	100.51
Davis 198 Shaft	99.69	N/D	0.58**	N/D	N/D	N/D	N/D	N/D	N/D	N/D	0.14	100.36

* Aluminum content is normal due to Agate preparation
** Aluminum content is elevated due to ceramic crusher preparation
N/D = Not detected

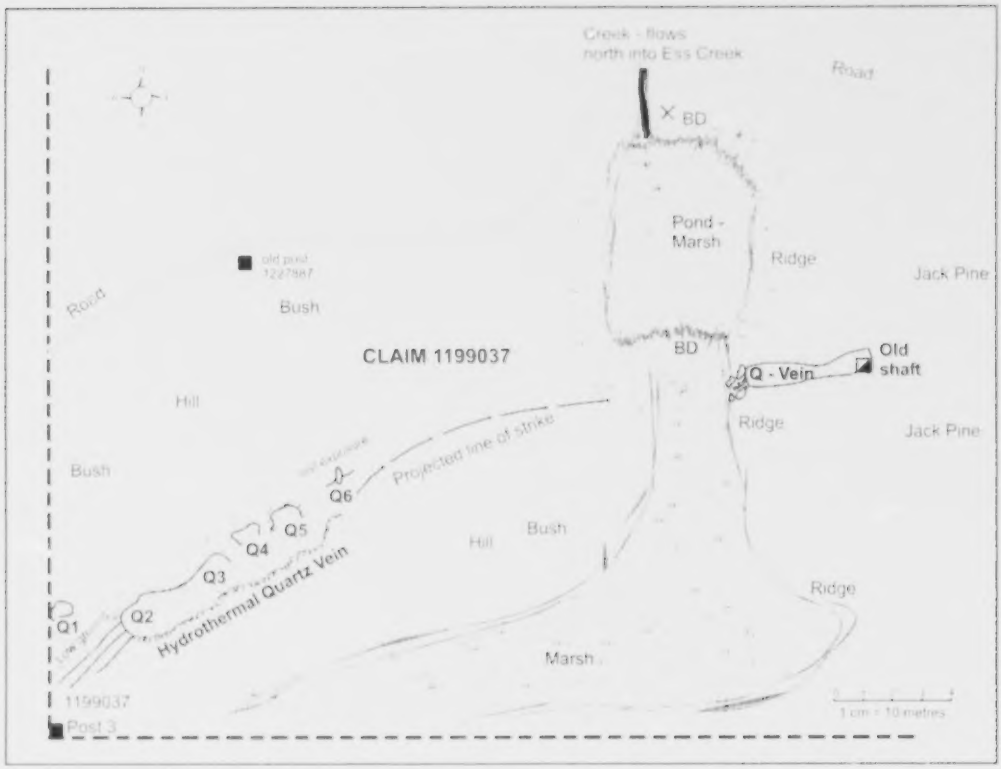

Figure 6. Wolverine Exploration Silica Property, map of Davis Township, claim 1199037. *Modified from* map supplied by D. Hanes, Wolverine Exploration. (BD = beaver dam.)

Photo 1. Outcrops on Wolverine Exploration Silica Property, claim 1199037. Left: Hydrothermal quartz vein on east side of marsh. Right: Stripped area, outcrop Q3. Contact located on west side only.

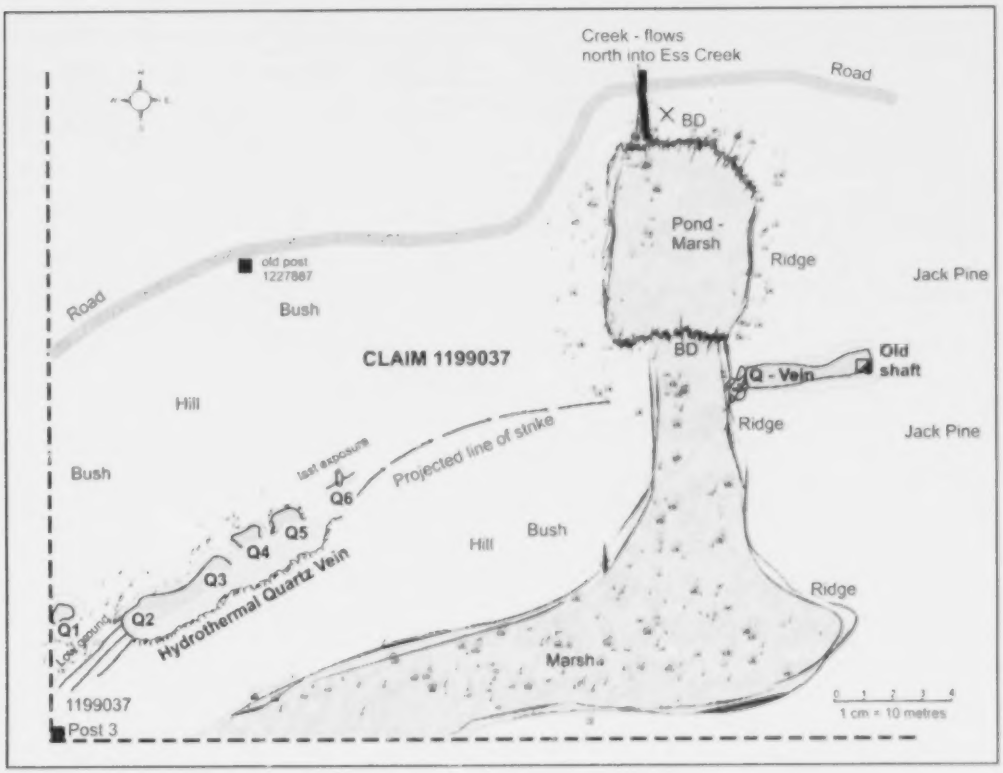

Figure 6. Wolverine Exploration Silica Property, map of Davis Township, claim 1199037. *Modified from* map supplied by D. Hanes, Wolverine Exploration. (BD = beaver dam.)

Photo 1. Outcrops on Wolverine Exploration Silica Property, claim 1199037. Left: Hydrothermal quartz vein on east side of marsh. Right: Stripped area, outcrop Q3. Contact located on west side only.

RECOMMENDATIONS FOR EXPLORATION

Platinum Group Elements (PGE), Ni, Cu

Exploration for platinum group elements has been the dominant activity in the Sudbury District for the past several years. The majority of exploration work is being conducted on differentiated mafic intrusive rocks of the 2.45 Ga East Bull Lake suite of rocks that include the River Valley, Agnew, and East Bull Lake complexes. Some work is also being carried out on 2.22 Ga Nipissing gabbro intrusive rocks, both east and west of Sudbury.

Much of this ground is held in good standing under the Mining Act as claims, leases and patents, with a substantial amount of assessment work yet to be applied. As such, opportunities for land acquisition on ground underlain by these mafic intrusive rocks are limited. However, several marginal areas of mafic intrusive rocks may also be prospective for platinum group elements. These include, but are not necessarily restricted to, the following:

1) mafic intrusive rocks north of the East Bull Lake complex in Lockeyer and Mandamin townships;
2) mafic intrusive rocks, particularly those currently considered as Nipissing gabbro west of Sudbury to Elliot Lake and hosted in Huronian Supergroup metasedimentary rocks of the Penokean Fold Belt;
3) Archean mafic intrusive rocks hosted within the Benny greenstone belt;
4) mafic intrusive complexes hosted within the Central Gneiss Belt (i.e. Whitestone, Arnstein and Eau Claire areas, Mattawan Township, McConkey Township);
5) areas within the Grenville Front Tectonic Zone east of the River Valley complex (Flett, Angus, and Parkman townships).

Targets to consider include known Ni-Cu occurrences, previously considered uneconomic for those metals, with emphasis on platinum group elements. There are two distinct styles of mineralization, namely:

1) disseminated magmatic sulphides, particularly within inclusion leucogabbronorite;
2) disseminated to massive, structurally controlled sulphides

Both types are enriched in platinum, palladium, copper, nickel, and gold. Recent work in the area suggests magmatic sulphides are more strongly enriched in the platinum group elements.

Offset Dikes of the Sudbury Igneous Complex

Exploration activity related to the search for undiscovered Offset Dikes of the Sudbury Igneous Complex has increased significantly following recent discoveries by Inco Limited at Kelly Lake on the Copper Cliff Offset and the Totten Mine on the Worthington Offset. Recent discoveries by FNX Mining Company Incorporated on the Parkin Offset and Tearlach Resources Limited on the Worthington Offset have further fueled the search. Known Offset Dikes can extend tens of kilometers beyond the limits of the SIC margin. Prospective ground includes those areas underlain by Archean granitic and migmatitic rocks, particularly north and west of the Sudbury Igneous Complex.

Flagstone

Exploration for high-quality flagstone should be emphasized, as production from one of Ontario's oldest and largest flagstone operations, the Mill Lake Stone Quarry, will be constrained in the coming years. This type of gneissic rock can be found along the Parry Sound shear zone from Parry Sound east to Huntsville. The Muskoka flagstone is in high demand and close to large markets.

Table 7. Mineral deposits not being mined in the Sudbury District in 2003.

Abbreviations

AF ..... Assessment Files
CMH ..... Canadian Mines Handbook
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... The Northern Miner
OFR ..... Open File Report
PC ..... Personal Communication

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Angus deposit (MDIR 31L14SW00014)	Ti, Fe	141 000 000 T @ 34.58% Fe, 15.64% TiO_2 to 1000 feet deep	Northoka Holdings Ltd.	AF Angus Twp.	Inactive patents
Bissett Creek deposit (MDIR 31L01SE00002)	flake graphite	26 038 000 T @ 1.86% flake graphite; 4 744 000 T @ 2.99% graphite	Industrial Minerals Inc.	AF Maria Twp.	Active
Brazeau Prospect (MDIR 31L02NE0010)	Va, Ti, Fe, (garnet)	110 000 T @ 0.76% V_2O_5, 7.9% TiO_2, 35.2% Fe for two lenses to 100 ft.; 950 000 T for 6 lenses to 100 ft.	A. Clark	MRC 11	Inactive
Burwash Lake Prospect (MDIR 41P02SW00006)	Fe	15 possible pit areas outlined containing indicated or inferred reserves of 450 000 tons per vert. foot, aver. 20.7 % Fe. Potential tonnage est. @ 100 million tons. Preliminary concentration tests – concentrate grading 68.2% Fe, 5.0% SiO_2 with recovery of 93%	Ownership unknown	MRC 11	Inactive
Butler (Crocan Lake) prospect (MDIR 31L11SE00012)	Kyanite	50 million tons @ 13-17% kyanite	Kyanite Mining Corp.	AF Butler Twp.	Inactive
Butler Vermiculite deposit (MDIR 31L11SE00003)	Vermiculite	"A" zone: 144 000 T @ 50-90% vermiculite	Hedman Res. Ltd.	n/a	Active
Cummings Lake Prospect (MDIR 41I16NE00036)	Fe	327.9 million tons @ 26.9% soluable Fe total	Rio Algom Ltd.	MRC 11	Inactive, underground exploration and bulk sampling
Errington/Vermilion Mines (MDIR 41I11SW00006)	Zn, Cu, Pb	4.4 million tons @ 1.33% Cu, 1% Pb, 4% Zn; 9 million tons @ 1.14% Cu, 1% Pb, 3.8% Zn (drilling by Falconbridge Ltd. has increased these figures)	Falconbridge Ltd.	MRC 12	Inactive, past producer
Falcon Gold (MDIR 41I10SE00003)	Au	Estimate 60 000 tons @ 0.23 oz/Au ton	Kinross Gold Corp.	E. Stringer, prospector, PC 1995	Inactive, underground development 1900's
Fostung (Texas) (MDIR 41I04NE00036)	W, Mo	F33-10 zone, 100 000 tonnes/vertical m @ 0.214% WO_4 with 81 200 tonnes/vertical m @ 0.23% WO_4 and 0.016 % MoS_2	Breakwater Resources Ltd.	Ginn, R. M. and Beechan, A. W., CIM Bulletin, V. 77, No. 863, p. 60, 1984	Inactive, extensive work by Sulpetro Minerals Limited in late 1970's, early 1980's
Geneva Lake Mine (MDIR 41I13SE00002)	Cu, Pb, Zn (Ag, Au)	170 000 T @ 11% Zn. (Small production - 80 588 tons high grade ore)	Natural Resource Holding & Consulting Inc.	Properties with Mineral Inventories, Ontario, Canada, February 1996	Inactive, past-producer 1940s

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Kidd Copper (AER Nickel)	Ni, Cu, PGE	Estimated 0.5 M tons averaging 0.71% Cu, 0.62% Ni in Robinson Zone (No. 1 Shaft area); 0.275 M tons @ similar grade in Rosen Zone (No. 2 Shaft area)	Crowflight Minerals Inc.	Canadian Mines Handbook (1969-70)	Active diamond drilling
Parkin Calcite (MDIR 41I15SW00041)	$CaCO_3$	147 460 probable and possible tons of "good, fair and poor" calcite	J. Brady	AF Parkin SP025	Inactive
Spanish River Mine (MDIR 41I05SW00014)	Cu, PGE	Estimate 0.9 million tons @ 0.5% Cu + PGM	D&H Consulting Services Inc.	AF	Inactive, past-producer 1969-70. 14 500 T stockpile on surface
Stralak Deposit (MDIR 41I13SE00044)	Zn, Cu, Pb (Ag)	800 000 tons @ 4% Zn, 0.3% Cu, 0.5% Pb, 2.0 opT Ag	Stralak Resources Inc.	AF	Inactive, last active 1993, diamond drilling
Sudbury Shakespeare (MDIR 41I05SW00076)	Ni, Cu, PGE	Estimated 2.1 million tons @ 0.36% Ni, 0.42% Cu, 0.44 g/t Pd, 0.40 g/t Pt, 0.22 g/t Au	Falconbridge Ltd., Ursa Major Minerals Inc.	Ursa Major Min. (company report)	Active
Wikwemikong (MDIR 41H13SE00012)	dolomite	Undetermined but possibly significant	Wikwemikong Unceded Indian Reserve	n/a	Inactive, some widely spaced diamond drill holes. Feasibility and several reports

Note: The resource estimates in this table do not follow the required disclosure for reserves and resources as outlined in National Instrument 43-101 and are historic figures generated by past workers.

OGS ACTIVITIES AND RESEARCH BY OTHERS

Recent publications and research work focussed on areas within the Sudbury District are listed below.

Sudbury Basin

1) Ames, D.E., Kjarsgaard, I.M. and Douma, S.L. 2003. Sudbury Ni-Cu-PGE ore mineralogy compilation: Sudbury Targeted Geoscience Initiative (TGI); Natural Resources Canada, Geological Survey of Canada, Open File 1787, 1 CD.

2) Dessureau, G. 2003. Geochemistry of the mafic and felsic norite in the Whistle Embayment: implications for the crystallization history of the Sudbury Igneous complex, Sudbury, Ontario; unpublished M.Sc. thesis, Laurentian University, Sudbury, Ontario, 134p.

3) Dubois, A.J. and Benn, K. 2003. Mapping and structural analysis in the southwestern Sudbury Basin: implications for mineral exploration; Ontario Geological Survey, Open File Report 6109, 26p.

The work presented here is included in the Sudbury Targeted Geoscience Initiative (TGI) designed to gain a better understanding of the tectonic deformation of the Sudbury Structure. The work is focussed on one of the most structurally complex parts of the structure, an area of 220 km^2 in Trill, Drury, Denison and Fairbank townships.

4) Dubois, A.J. and Benn, K. 2003. Structural analysis and three-dimensional modelling of the southwestern Sudbury Basin: implications and recommendations for mineral exploration; Ontario Geological Survey, Open File Report 6121, 38p.

The work presented here is included in the Sudbury Targeted Geoscience Initiative (TGI) and is a continuation of work completed for OFR 6109. Results of mapping, petrographic studies and relogging of drill cores are incorporated into three-dimensional structural models of the study area. The results reveal that an early stage of normal faulting is required to explain the map pattern and structural repetitions documented in the drill cores. The early stage of normal faulting was most likely coincident with the cooling of the Sudbury Igneous Complex and may have been due to collapse of the walls of the crystallizing melt body.

5) Humminicki, M. 2002. Geology, Mineralogy and Geochemistry of the Kelly Lake Ni-Cu-PGE deposit, Sudbury, Ontario; unpublished M.Sc. thesis, Laurentian University, Sudbury, Ontario, 219p.

6) E. L'Heureux, H. Ugalde, B. Milkereit, J. Boyce, W. Morris, N. Eyles of the University of Toronto and McMaster University gave a KEGS presentation on December 10, 2003 entitled "Marine magnetic, gravity and seismic surveying for the determination of structural deformation and a possible meteorite impact in Lake Wanapitei, Ontario". They concluded that Lake Wanapitei impact crater is at most 5 km in diameter based on the magnetic signature of the dikes, seismic character of sediment bed and gravity anomaly.

7) Legault, D., Lafrance, B. and Ames, D.E. 2003. Structural study of Sudbury Breccia and sulphide veins, Levack Embayment, north range of the Sudbury Structure, Ontario; Geological Survey of Canada, Current Research, no. 2003-C1, 9p.

The paper concludes that the Sudbury breccia originated by in situ brecciation during propagation of impact shock waves, rather than by milling and friction melting along superfaults during collapse of impact crater walls. Sulphide veins were emplaced in tensile fractures that propagated perpendicular to gneissic foliation and coincided with hydrothermal activity.

8) Lesher, C.M. [editor] and Thurston, P.C. [editor] 2002. A special issue devoted to the mineral deposits of the Sudbury Basin; *in* Economic Geology and the Bulletin of the Society of Economic Geologists, v. 97(7), p.1373-1625.

Numerous papers on Sudbury are published in this special issue and include discussions on mineralization in the Foy offset dike, Whistle-Parkin offset dike, Worthington offset dike, Copper Cliff offset dike, Copper Cliff North area, Copper Cliff South mine, North Range and Strathcona Embayment, Victor Deep, McCreedy East, and Trillabelle deposits.

9) Naldrett, Anthony J. 2003. From impact to riches; evolution of geological understanding as seen at Sudbury, Canada; *in* GSA Today, v.13(2), p.4-9.

10) Napoli, M.G. 2003. Geology of the Wanapitei Complex, Grenville Front, Ontario; unpublished M.Sc. thesis, Laurentian University, Sudbury, Ontario, 236p.

11) Rousell, Don H., Fedorowich, John S. and Dressler, Burkhard O. 2003. Sudbury Breccia (Canada); a product of the 1850 Ma Sudbury Event and host to footwall Cu-Ni-PGE deposits; *in* Earth-Science Reviews, v.60(3-4), p.147-174.

They concluded that the Sudbury Ni-Cu-PGE magmatic sulphide deposits may be classified into four types based on structural setting: Sudbury Igneous Complex – footwall contact, footwall, offset and sheared deposits. Sudbury Breccia is the main host for footwall deposits. Sudbury Breccia locally hosts mineralization in radial concentric offset dikes.

12) Vaillancourt, C., Sproule, R.A., MacDonald, C.A. and Lesher, C.M. 2003. Investigation of mafic-ultramafic intrusions in Ontario and implications for platinum group element mineralization: Operation Treasure Hunt; Ontario Geological Survey, Open File Report 6102, 335p.

This report divides PGE mineralization into five types and describes localities of PGE mineralization across Ontario, including Sudbury basin, Temagami greenstone belt, Nipissing Diabase Dikes and Caribou Lake intrusion and Papineau Intrusion (Grenville Province).

13) The University of New Brunswick Impact Geology Group, led by J. Spray, conducted research on several areas of the Sudbury Igneous Complex, as follows:

- M. Boast investigated the metamorphic basement rocks beneath the SIC as part of a Ph.D. thesis.
- A.J. Murphy, also as part of a Ph.D. thesis, worked on the geological setting of the Whistle and Parkin offset dikes.
- J.P. O'Conner described the geological setting of the Manchester Offset dike as part of his M.Sc. thesis.
- M. Tuchscherer conducted similar work on the Foy Offset Dike.
- R.G. Scott investigated the geological setting and magnetics of the South Range Breccia.

East Bull Lake / River Valley

1) Easton, R.M. 2003. Geology and mineral potential of the Paleoproterozoic River Valley Intrusion and related rocks, Grenville Province; Ontario Geological Survey, Open File Report 6123, 172p.

The study examined East Bull Lake intrusive suite rocks located in Crerar, Dana, Henry, Loughrin and Street townships. At least 5 main bodies of East Bull Lake intrusive suite rocks are present in the study area: River Valley, Loughrin Lake, Third Concession and Contact intrusions and Street metagabbro. Mineral exploration for copper, nickel and platinum-group elements in the study area should focus on East Bull Lake intrusive suite bodies that exhibit a well-defined stratigraphy containing a variety of mafic rock types, as well as areas where primary intrusive contacts are preserved.

2) Easton, R.M. 2003. Whole-rock and mineral chemistry, assay and petrographic data for the River Valley Intrusion, Crerar and Dana Townships, Grenville Province, Ontario; Ontario Geological Survey, Miscellaneous Release – Data 95.

3) James, R.S., Easton, R.M., Peck, D.C. and Hrominchuk, J.L. 2002. The East Bull Lake intrusive suite: remnants of an approximately 2.48 Ga large igneous and metallogenic province in the Sudbury area of the Canadian Shield; *in* Economic Geology and the Bulletin of the Society of Economic Geologists, v. 97(7), p.1577-1606.

4) James, R.S., Jobin-Bevans, S., Easton, R.M., Wood, P., Hrominchuk, J.L., Keays, R.R. and Peck, D.C. 2002. Platinum-group element mineralization in Paleoproterozoic basic intrusions in central and northeastern Ontario, Canada; *in* Special Volume - Canadian Institute of Mining and Metallurgy 1982, v. 54, p.339-365.

Includes East Bull Lake intrusion and Nipissing Diabase.

Miscellaneous Grenville Province

1) Easton, R.M. 2003. Project Unit 03-009. Reconnaissance study of the geology and mineral potential of the Eastern Tomiko Terrane, Grenville Province; *in* Summary of Field Work and Other Activities 2003, Ontario Geological Survey, Open File Report 6120, p. 16-1 to 16-25.

The purpose of this study was to determine if Tomiko terrane is favourable host for Broken Hill-type zinc-lead mineralization, to collect samples for geochronology and to determine if additional detailed field study is warranted.

2) Easton, R.M. 2002. Geology of mafic intrusions of Flett and Angus townships, Grenville Province; Ontario Geological Survey, Open File Report 6090, 70p.

The Fanny Lake and Fall Lake intrusions are located in Flett and Angus townships and are roughly 32 km southeast of the community of Temagami, Ontario. This study focussed on the tectonic affinity and mineral potential of these intrusions. Sulphide-bearing zones or above background levels of copper, nickel or platinum group elements were not detected in the Fanny Lake intrusion or in the Fall Lake intrusion.

Table 8. Publications received by the Sudbury District Geologist office in 2003.

Title	Author	Type and Year of Publication
Proterozoic Geology of the Lake Panache-Collins Inlet Area, Ontario (two copies)	Frarey, M.J.	Geological Survey of Canada, Paper 83 – 22, 61p., 1985
Project Report Airborne Gravity Evaluation Survey, Timmins, Ontario, (two copies)	Sander Geophysics Ltd. and Elieff, S.	Timmins Economic Development Corporation, Discover Abitibi Initiative, 37p., 2003
Bats and Mines, Resource Publication No. 3 (three copies)	Tuttle, M.D. and Taylor, D.A.R.	Bat Conservation International Inc., 50p., 1998
Canadian Mines Handbook 2003 – 2004		Business Information Group, 768p., 2003
Precambrian Geology Compilation Series Sault Ste. Marie – Blind River Sheet, scale 1:250 000	Johns, G.W., McIlraith, S. and Muir, T.L.	Ontario Geological Survey, Map 2670, 2003
Precambrian Geology, Shining Tree South Area	Johns, G.W.	Ontario Geological Survey, Preliminary Map P.3531, 2003
Investigation of Mafic-Ultramafic Intrusions in Ontario and Implications for Platinum Group Element Mineralization: Operation Treasure Hunt	Vaillancourt, C., Sproule, R.A., MacDonald, C.A. and Lesher, C.M.	Ontario Geological Survey, Open File Report 6102, 335p., 2003
Mapping and Structural Analysis in the Southwestern Sudbury Basin: Implications for Mineral Exploration	Dubois, A.J. and Benn, K.	Ontario Geological Survey, Open File Report 6109, 26p., 2003
Report of Activities, 2002, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Lichtblau, A., Ravnaas, C., Storey, C.C., Raoul, A., Kosloski, L. and Wilson, S.	Ontario Geological Survey, Open File Report 6110, 112p., 2003
Report of Activities, 2002, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	Mason, J.K., White, G.D., O'Brien, M.S. and Komar, C.	Ontario Geological Survey, Open File Report 6111, 37p., 2003
Report of Activities, 2002, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C. and O'Brien, M.S.	Ontario Geological Survey, Open File Report 6112, 55p., 2003
Report of Activities, 2002, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M., Seim, G.Wm., Wilson, A.C., Draper, D.M., Farrow, D., Hope, P. and Koroschetz, A.M.	Ontario Geological Survey, Open File Report 6113, 84p., 2003
Report of Activities, 2002, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury District	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., Beauchamp, S. and Chaloux, E.C.	Ontario Geological Survey, Open File Report 6114, 72p., 2003
Report of Activities, 2002, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre and Petroleum Resources Centre	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Barua, M., Laidlaw, D.A. and Carter, T.R.	Ontario Geological Survey, Open File Report 6115, 118p., 2003
Report of Activities, 2002, Resident Geologist Program, Regional Land Use Geologist Report: Northwestern, Northeastern and Southern Ontario Regions	Debicki, R.L., Drost, A.P., Hinz, P., Rowell, D.J. and Yule, G.R.	Ontario Geological Survey, Open File Report 6116, 27p., 2003
Regional Modern Alluvium Sampling Survey of the Sault Ste. Marie-Espanola Corridor, Northeastern Ontario: Operation Treasure Hunt	Reid, J.L.	Ontario Geological Survey, Open File Report 6117, 147p., 2003
Summary of Field Work and Other Activities	Baker, C.L., Kelly, R.I., Parker, J.R., Ayer, J.A. and Easton, R.M.	Ontario Geological Survey, Open File Report 6120, 2003

Title	Author	Type and Year of Publication
Structural Analysis and Three-Dimensional Modelling of the Southwestern Sudbury Basin: Implications and Recommendations for Mineral Exploration	Dubois, A.J. and Benn, K.	Ontario Geological Survey, Open File Report 6121, 38p., 2003
Geology and Mineral Potential of the Paleoproterozoic River Valley Intrusion and Related Rocks, Grenville Province	Easton, R.M.	Ontario Geological Survey, Open File Report 6123, 172p., 2003

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Cosec, M., Beauchamp, S. and Meyer, G. 2003. Sudbury District Report of Activities; *in* Report of Activities 2002, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts, Ontario Geological Survey, Open File Report 6114, 72p.

Giancola, D. 2003. Canadian Mines Handbook; Hollinger Canadian Newspapers L.P., Don Mills 768p.

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in **bold** *type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.*